Textile World

VOL. 86, NO. 5—ESTABLISHED 1868

CONTENTS APRIL, 1936

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MANAGEMENT
The Robert Report Says So (*Editorial*) 77
The Editor Says 78
The Editor Presents, This Month and Next 79
In the Month's Textile News 80
$7,500,000 Damage to New England Mills by Flood 82
Wool Heads D-13 Program; Cotton Typp Recognized 85
Guide to 32d Annual Knitting Arts Exhibition 93
Going South? Re-Location No Automatic Solution 97
$49,000 a Year Saved by a Standard Cost System 102

MERCHANDISING
Textiles in the Museum 86
New Half-Hose—Original Patterns for 1936 99

MEN
Textile Personalities 84
The Overseers' Corner 117
Personals 128

MILL ENGINEERING
2c. per 1,000 Gallons—That's All It Costs to Purify Water 90
Improved Lighting Speeds Colored Yarn Production 112
New Machinery and Processes 126

METHODS
New Satin Season Will Produce More Fabric Changes 87
Analysis of Fabrics Shown at N. C. Textile School Show 88
Breaking the Shed Sometimes Advisable on Wool Looms 89
Finishing Plants Find Good System of Lot Chasing 92
Underwear Fabrics on Which Knitters Are Relying 100
Tale of a Pail—It Started a Modernization Program 104
Seamless Hosiery Progresses—Recent Improvements 106
Proper Storage and Suitable Nets Economize Hosiery Dyeing .. 107
Rib Cuffs and Bottoms on Flat Machines With Racking 108
Fugitive Tints Now Aid Knitter and Weaver 109
How Georgians Spin and Card 122
Staple Cotton Fabrics 124
Lickerin Damage Minimized by Speeds and Settings 125
Dyeing Wool at Low Temperatures 140

▼

KNITTING ARTS EXHIBITION NUMBER

Knitting Features, pages 93-108

Index on page 139

▼

DEPARTMENTS

The Overseers' Corner 117
Questions and Answers 119
Personal Page 128
New Machinery and Processes 126
New Publications and Business News 130
TEXTILE WORLD Analyst 131
Business Literature 144

INDUSTRY BRANCHES

Cotton Digest 132
Wool Digest 134
Rayon and Silk Digest 136
Knitting Digest 138
Processing Digest 140
Engineering Digest 142
Industry-Wide Events 130

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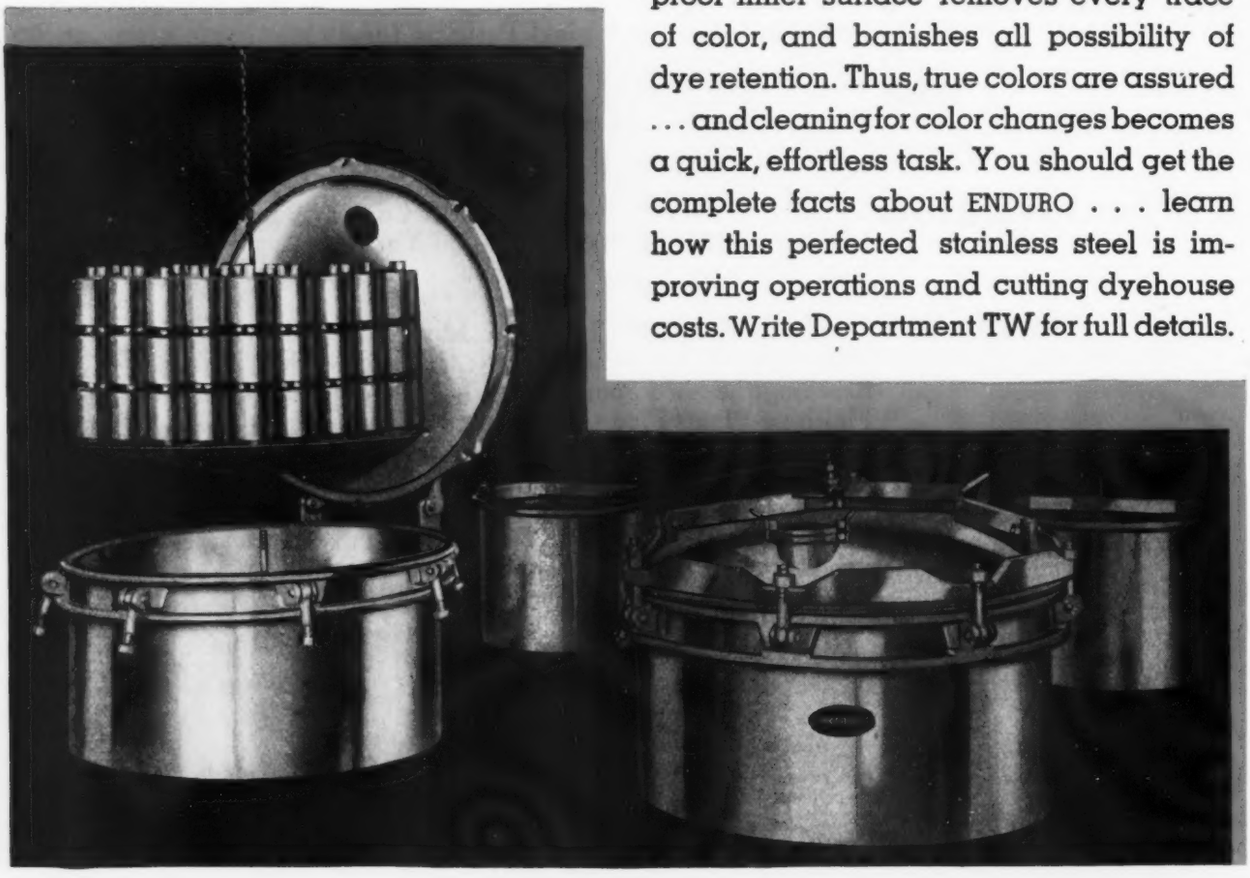

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Textile World

April, 1936

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Editor: DOUGLAS G. WOOLF

The Robert Report Says So

ONE of last month's events was of greater importance to the textile industry than seems to be generally appreciated. We refer to the Robert Committee Report on post-NRA adherence to code standards.

In that report, two of the branches of this industry—cotton textiles and wool textiles—were placed in the highest bracket of conformance, being two of a select group of four industries in which code hours and code minimum wages were found to apply to *all* the employees in more than four-fifths of the establishments surveyed. Another branch—hosiery—was included in the second highest group, in which standards were observed in more than two-thirds of the establishments surveyed. In the next group—comprising those industries where conformance was noted in more than half but less than two-thirds of the establishments surveyed—were included silk textiles, throwing, and underwear. Incidentally, exception was taken by representatives of the two last-named industries to certain of the implications of the report.

In any event, however, we regard the findings, as a whole, of vital significance to our industry.

Why?

■

Well, in the first place, the industry's performance after the Supreme Court's NRA decision last spring was one of the finest jobs—if not *the* finest job—in its history. Instead of chaos, we experienced orderly maintenance of code standards after all enforcement provisions had been suddenly and dramatically lifted. It was largely the consciousness of its own strength and sanity in this connection that enabled the industry to climb out of the stagnation of the first half of 1935 and to end the year on the up-and-up. Consequently, it is most heartening to see the facts of this performance substantiated in an official report.

Second, the industry has been forced to take the most unfair abuse during recent months. As we listened to the Ellenbogen Bill hearings, for example, we heard apparently unending testimony produced by the U. T. W. attempting to show practically complete abandonment of code standards in textile mills. Most of the attack was directed toward the cotton and wool divisions. And yet, in each of those branches the Robert Committee reported that "on the whole the survey indicates little departure from any code provisions since May 27, 1935."

So much for the irresponsible statements made by Gorman and his crowd. No wonder his "leadership" has been completely discredited.

■

This report has an even deeper significance for the textile industry however. Practical unanimity of action in these two great branches of a decentralized industry means something. It means, as we stated in our Annual Number, that the industry was convinced that conformance was necessary in its own interest. We are just as confident today that textile manufacturers do not want to go back to the days when there was no cellar to wages and no ceiling to hours.

Within the last month, we had an example of leadership in this connection. In hosiery, the labor structure in seamless was threatened by lengthening the work-shift in a section of the industry. Under the auspices of the industry's association, a series of intimate conferences was held and at this writing it appears probable that the threatened collapse of standards has been averted.

As we have stated previously in these columns, we hold no brief for static policies. We think all standards should be subject to review and to change. However, we believe firmly that such change should come about in an orderly, thoughtful manner rather than through the disastrous process of degeneration.

The former method is a sign of intelligent self-government. And the Robert Committee Report demonstrates that the textile industry is most capable of just that. Consequently, it cannot afford to depart from it now, because it would have no alibi.

The Editor Says:

Cotton Industry and the South

THE American Cotton Manufacturers Association chose wisely when it selected for its annual meeting at Pinehurst, May 1 and 2, the following keynote:

"The Social and Economic Value of the Cotton Textile Industry to the South."

So many lies have been told about southern cotton manufacturers during recent years that it pays to use as an antidote some of the facts in the case.

The economic importance of the industry to the South is too obvious to require explanation. It is on the social side that a little discussion is in order.

More than 17 years ago we made our first editorial trip to that section and came back impressed with the value of the southern cotton industry as a great socializing force. We recall that we wrote a series of articles on the subject at that time. Since then we have been revisiting the section several times a year and never have had occasion to change our opinion. Just last month we traveled through Georgia and were impressed anew by the educational influences which cotton manufacturers are bringing to bear upon their communities.

We realize, of course, that there has been a lot of bunk written and said on both sides of this subject. Attempts to paint manufacturers as saintly beings whose life-work is service to their fellow-men are not quite necessary. Manufacturers don't need that type of deification. The facts are that, first, they have found that the development of the citizenry in a mill town makes for a more profitable community and enterprise; and, second, they themselves live with these people, and like and respect them just as all of us like and respect most of the people among whom we live. Consequently, the manufacturers are not doing something *for* their employees; they are doing things *with* them.

On the other hand, the tendency to deny the social value of the industry—and even to decry its existence as a "paternalistic" menace—is merely a manifestation of bitterness. Here again, we have no illusions. We know that times have changed and are still changing, and that some of the methods of years gone by are no longer suitable. A new generation has grown up—thanks to the industry itself—stronger, abler and more independent than its forbears who dropped down from the mountains to work in the mills. These people of today do not need or want what their grandfathers and grandmothers needed and wanted. Sometimes individual manufacturers are slow about adjusting their attitudes to these new conditions, but on the whole, the industry is keeping step with the times. In educational work, particularly, lies the best hope of furthering the development of the South as a place in which to work and to live.

Although basically unsentimental, we can never think of the creation of the southern textile industry without experiencing a thrill. It *has* been a great force in the progress of that section. It *is* a force today—and will continue to be one. It is therefore in order that the manufacturers should take time out at their annual meeting to gauge progress made to date and to chart the trends of the future.

Better Than 50-50

TEXTILE manufacturers can afford to be encouraged by recent developments in connection with the tax aftermath of the defunct AAA and the tax prospects of its more high-brow successor, the Soil Conservation and Domestic Allotment Tax.

Without trying to pose as a political seer, we would say that things look about like this just now (Apr. 13): The windfall tax will undoubtedly be included in the new tax law, and although it will be one more headache, it won't be the complete pain-in-the-neck it once threatened to be. Thanks to the leadership of the Cotton-Textile Institute, the folly of trying to take the industry's shirt off its back was demonstrated.

As to processing taxes, the odds just now are better than 50-50 against their probability. The House wants to lay off them. The Senate hasn't the same political reason to be afraid of them and may force them back into the bill if there seems no other way of meeting the amounts specified by the Administration. But, if so, the House would probably put up a good fight in conference. The net, as we said above, is an edge in favor of no processing tax, in our humble opinion.

And anything better than 50-50 on the favorable side has always appealed to us as cause for optimism.

■

Serious Stuff

WE HAVE cited, thus far in this issue, two reasons for confidence. On the previous page we mentioned the Robert Committee Report. Above, we outline the improved prospects in connection with both windfall and processing taxes.

Unfortunately, cotton manufacturers—at least—do not seem to share this hopefulness. We base this statement on our table of manufacturing margins in carded fabrics (TEXTILE WORLD Analyst, page 131 of this issue). It will be noted that the March average in that group was almost back to the low of last July, and was considerably below the average for the first six months of last year.

Think that over for a moment! What we are talking about is profit possibilities. And those are less possible now than they were during a period when, according to the Federal Trade Commission's recent study, a group of 303 combined cotton spinning and weaving companies suffered net loss at the rate of 3.90%.

The immediate cause of the latest softening in prices, of course, has been restriction in demand. But the lull has been natural enough; tax uncertainty was the principal cause. The industry has had such spells over and over again before, and will have them over and over again in the future. Must it get the jitters and throw away all chance for profit every time?

Study that table on page 131. Notice how margins started to climb in August, kept strong through October, sagged in November, picked up again in January, but now are on the skids once more. You can't make money that way no matter how good you are.

The mood of last August must be recaptured—and held. This is serious business, believe it or not.

The Editor Presents:

This Month

Tragedy:

Textile mills and their workers were badly hit by the flood that tore down the river valleys in New England and Pennsylvania. One of our editors took a look—and a few pictures. (Page 82.)

Fugitive Tints:

Long used by the throwster, this type of dye is now being employed by weavers and knitters for identifying yarns and fabrics. For a practical and detailed discussion of the selection and application of fugitive tints, see the special color insert starting on page 109.

Staple Cotton Fabrics:

John Hoye, the fourth instalment of whose series appears on page 124, received his textile education at Royal Technical College, Salford, near Manchester, England. He obtained his early training in the cotton-goods trade when associated with English "shippers"; i.e., firms which convert goods for export. He has been connected with Neuss Hesslein and Joshua Hoyle, and he is now with Herbert G. Franz.

New Satin Season:

Many old stand-by satins are in production, of course; but more new constructions are being worked out. Some of them on page 87.

Choice of the Manikins:

Exactly 172 college girls have selected the fabrics they will wear at the annual style show in Raleigh, N. C., this month. Their favorites are analyzed on pages 88 and 89.

Breaking the Shed:

Is often advantageous on wool looms, says B. F. Hayes on page 89, particularly when cotton or silk yarns are run side by side with wool yarns.

Aqua Pura:

Just Latin for the pure water which Bigelow-Sanford Carpet Co. is obtaining from a new filter plant which treats 3,500 gal. per min. at a cost of only 2c. per 1,000 gal. For details see page 90.

Going South?

The much discussed question of hosiery plant migration is analyzed frankly by an impartial observer—Dr. George W. Taylor—on page 97.

Hosiery Matters:

Four articles in this issue will appeal to hosiery men. They can learn about cost work in finishing full-fashioned on pages 102 and 103, about improving women's seamless on page 106, about designing salable half-hose on page 99, and about dyeing hosiery on page 107.

Summer Underwear:

Will it be knitted or woven? Beginning on page 100, John Chamberlain, internationally known authority on knitting matters, discusses the knit fabrics most likely to hold the field.

Still in Business:

"If we had not put the plant in shape when we could, we would not be in business today; if we do not keep on modernizing, we shall not be able to stay in business." Those words, spoken by the president of a finishing company, epitomize the story of a modernization program which started fifteen years ago and has never ceased. See page 104.

Down in Georgia:

A concise summary of vital facts relating to carding and spinning practices, as discussed at the spring meeting of the Textile Operating Executives of Georgia, will be found on page 123.

Back Strain Eliminated:

The master mechanic at Piedmont (S. C.) Mfg. Co. has constructed a compressed-air lift which dumps bobbins automatically from doff boxes into the hopper of a yarn conditioner. This same article on page 117 describes several other practical devices recently developed in southern mill shops.

More or Less Personal

THIS IS our Annual Knitting Number, published in connection with the Knitting Arts Exhibition in Philadelphia. The section starts with the Guide to Exhibits on page 93 and follows with a series of articles surveying the latest developments in knitting technique and markets. . . . .

WE WERE a little late mailing this month, thanks to the flood which delayed receipt of copy and cuts from advertisers. . . . .

THE EXPANDED Overseers' Corner, started last month, seems to have rung the bell. It appears in this issue starting on page 117.

Next Month

Calculating Organizations: One of the most important calculations made by cotton spinners is that for machinery organizations — i.e., drafts, doublings, weights, numbers of spindles, etc., to produce a given yarn of a specified quantity. A serious gap in textile literature is the absence of a published procedure for making this calculation; but next month TEXTILE WORLD will begin to fill this gap.

Better Tops: There will be some practical advice in next month's issue on the efficient production of long-fiber, luctrous tops.

Warp Corkscrews: What causes them in pure-dye satin and similar work? How can they be prevented? The answers next month.

A Baffling Problem: For over six months the mill had been troubled with a defect which cropped up all too frequently in aniline black prints. Practical solution of the problem is the theme of an article in the May issue.

Three-Day Delivery: The converter wants his goods in a hurry; the finisher wants to make a profit. A practical article on processing rayon French crepes tells how the wishes of both converter and finisher can be attained.

Last Month

Comments on Editorial:

"I find it hard to properly express to you my appreciation for the editorial on the educational program for the textile schools, which you published in your March issue. You could not have better outlined what the Textile Foundation and the school heads have in mind than in the analysis you have made of this program. If this report becomes a contribution to the textile industry in the way that you have emphasized, not the least reason for this will be because you have publicized and interpreted what is going on in a constructive and purposeful fashion. . . ."

"I do not believe I can add anything to your editorial. I think you have hit the nail on the head and hope that as opportunity presents itself you will continue to call to the attention of manufacurers the need for their further and continued interest in the texile schools."

And on the "Annual":

"For quite a while I've been meaning to write you on your editorial 'Tuning Up for Better Profits,' in your Annual Number but this seems the first opportunity I've had, because I've been so everlastingly on the jump. It was an excellent editorial in my opinion and I have called it to the attention of all my head men in the mills. . . ."

"May I add my congratulations to the many others you have no doubt received on the Annual Review. While I realize how many weeks of work this entailed, I feel that you are amply repaid by the results. It is a number that should be kept in a convenient place for weeks to come."

Latin American Missions Considered

NEWS of proposed missions to Latin America to investigate chances for increasing sale of American textiles to those countries apparently leaked out prematurely last month. It is known that the possibility of missions of this type was suggested by Secretary Roper last December and that recently he had explored the proposal with officials of other departments. Definite plans had not been formulated. Publication of the news of this intent hastened action, however, and a 10-year statistical study of textile exports from the United States and other countries to Latin America is under way.

At this writing, no announcement has been made regarding the plan, and it is stated that no mission will leave until a definite and practical program has been laid out.

Incidentally, one of the rumored phases of the plan involved the idea of trading used American textile machinery to Latin American countries for a series of agreements by those countries to purchase large quantities of American fabrics. Finishing machinery was mentioned particularly in this connection. No official support of this idea is indicated.

Windfall Tax a Potential Nuisance

By Paul Wooton

Washington Correspondent, TEXTILE WORLD

LITTLE revenue is likely to result, within a year, from the proposed "windfall" tax. If it should be enacted into law in the form proposed by a majority of the Ways and Means committee it is certain to be carried to court. While a report, dealing largely in generalities, is a poor substitute for an actual draft of proposed legislation, enough is revealed of the proposed plan to indicate that injustices are certain to result. Some have reached the conclusion that there is no practical way in which a special income tax can be levied on those it is desired to reach and the levy withheld from certain other incomes.

As the plan stands at this writing, there is certain to be harassment, not only of those who received processing tax refunds, but of all who pay any excise tax. This is the more important as the processing excises may go back into the bill, although at this writing the best opinion seems to be that the chances are against such an outcome.

The administrative difficulties of collecting such a tax were brought home to members of Congress when the Cotton-Textile Institute submitted its 2,000 words of comment on the proposed "windfall" and floor stocks taxes.

Corporate Surplus Tax: Difficulties, however, are not confined to the "windfall" tax. In attempting to work out the tax on corporate surpluses, it is being found that so many exemptions must be made that estimates of yield constantly must be revised downward. As the original proposal is applied to more and more actual concerns, it is being found that large concerns with existing surpluses do not suffer as many ill effects as do the smaller corporations that are not in such a liquid position. Surpluses of companies with capitalization under $50,000 fell from $8,224,663,000 in 1929 to $438,069,000 in 1933. At the same time, during the depression, the big corporations increased their surpluses from $20,692,610,000 in 1929 to $33,200,000,000 in 1933.

At this writing, indications are that in the end the existing corporation taxes will be retained. The experiment with the tax on surpluses probably will be confined to a tax to be superimposed on the existing tax structure. Reliance must be placed on the Senate hearings. The House hearings were hurried and were based upon the generalities of a half-baked report. The bill will be rewritten in the Senate, it is predicted in well-informed quarters.

Ellenbogen Bill Changed But Sinister

THE Ellenbogen Bill, with a few of its teeth extracted but with still enough left to look like a big bad wolf, was introduced into the House last month. The best dope from Washington continues to be to the effect that the bill has absolutely no chance of passage; in fact recent events indicate that the measure will get no support from the Administration and consequently will not pass.

Among the changes made in the bill before it was reported out of committee, were the practical elimination of the licensing provision, and a decided modification in the work assignment clauses. However it sets up minimum wages for all occupational classifications in the textile industry; provides for a 35-hr. week, with two shifts; retains the use of labels; and, in the words of Arthur Besse, "provides for the establishment of a Federal commission with power to control details of operation which such a commission cannot properly administer and gives to the commission power which, if used at all, would unquestionably operate to seriously handicap many elements in the industry with whose problems such a commission could not be expected to be familiar."

"The bias of the bill is most unfortunate," states Mr. Besse. "That bias, however, leaves us no common ground on which to discuss the bill and we have no alternative but to oppose a measure which seems to us both unfair and unwise."

As we go to press, still another version of the bill is being expected from the House Labor Committee. It has been rewritten again within the sub-committee in charge.

Colors, Fabrics, —and Petticoats

By Emma Lou Fetta

COLOR will be accented in women's fashions next fall. Persian shades, regal colors, bright deep golds and browns and grays. Black will be less important but seen. Blue-green will replace navy to some extent. All the most glamorous reds will be seen. Ermine-white is anticipated as an accent against dark, bright shades. There will be mauves, and the whole purple family from royal to pastel violet and orchid is predicted for fall favoritism. New colors, developed for the Coronation in London, are expected here.

In fabrics, it continues to be evident that satin will stand out, as well as crepe, velvet, lace, net and costly lamés and taffeta. Frosty crepes are talked about for daytime. Tweeds should enjoy an enviable season.

Contrasting fabrics should have a hey-day in the autumn. In the evening interest will range over a wide gamut: from flannel-like sombre dinner suit materials to Court influences and fluffy daintiness.

Full skirts should influence 54-inch materials. Drapability is a fabric keynote straight through the picture. . . . With boleros, sashes are coming in; ribbon-makers should look into this. . . . Flared skirts disclosing gay petticoats reflect the effort to re-establish femininity.

Japanese Import Limit Again Urged

THE threat to the domestic cotton textile industry from steadily increasing Japanese imports again came to the fore in Washington last month with the introduction into Congress of data and argument prepared by Cotton-Textile Institute and forwarded by National Association of Cotton Manufacturers. The Institute's letter urged that action be taken to protect the industry under section 22 of the A. A. A., now made applicable by Amendment to the Soil Conservation Act, and also sug-

gested prompt hearings before the Tariff Commission.

In support of this request, figures are presented showing further and alarming increases in imports in January of this year. In that month 6,812,986 sq.yd. were brought in, a volume more than double that of January, 1935, and some 2,000,000 sq.yd. greater than that of the previous peak month of February, 1935. The January, 1936, imports were at the rate of over 80,000,000 sq.yd., compared with a total of about 36,474,000,000 sq.yd. for 1935.

Tornadoes Wreck Southern Mills

A BARRAGE of tornadoes descended upon the South while New England and the East were shoveling mud from doorsteps and pumping out basements as a result of devastating floods. Howling, twisting winds struck parts of Georgia, South Carolina, North Carolina, Mississippi, Arkansas, Tennessee and Alabama, killing hundreds of persons, injuring thousands and causing property damage to run into millions of dollars. In many instances, fire followed on the heels of the wind, adding horror to the catastrophe. Towns hardest hit were Gainesville and Cordele, Ga., Tupelo, Miss., Anderson, S. C., and Greensboro, N. C.

Textile mills and villages located at several of these towns were damaged by the high winds. Pacolet Mfg. Co., New Holland, Ga., adjoining Gainesville, had its roof and parts of the two top stories blown off. Both ends of the huge plant appeared to be crushed, and houses in the village were affected. Appleton Mills Co., Anderson, S. C., suffered considerable damage to its roof and spinning room. A number of village houses were battered considerably. Anderson Cotton Mills, also located at Anderson, were damaged somewhat about the roof, but not seriously. In the village, however, 35 to 40 houses were wrecked, anywhere from 25 to 100%.

The first tornado, which wrecked Tupelo, Cordele and Greensboro, about a week before the Gainesville and Anderson tragedies, also struck Concord, N. C., where it partially de-roofed and otherwise injured Mills Nos. 2 and 6 of Cannon Mills Co., damage being estimated at approximately $10,000. Kerr Bleaching & Finishing Works, Concord, were damaged slightly at the same time. Greensboro textile mills were reported unharmed.

A few plants, including Norris Cotton Mills Co., Cateechee, S. C., suffered flood damage to power plants and warehouses. On each occasion, when the twisters were on rampage, many mills were forced to cease operations temporarily because of wrecked power lines. The number of injured textile workers is unknown at this writing, but is thought to be fairly large.

Building and power plant of Owen-Osborne, Inc., Gainesville, suffered considerable damage, and several operatives were reported injured and killed.

Later reports indicate that textile mill damage is not as great as first feared, particularly in the Anderson area. A large number of plants were forced to close down temporarily because of high water.

View of Pacolet Mfg. Co. plant at New Holland, Ga., near Gainesville which lost its roof and portions of the two upper stories. The damage shown is typical of the injury suffered by mills in the tornado path. Several mill villages also were badly battered.

Sugar Institute Decision Helpful

The Sugar Institute decision of the Supreme Court should help industry mark a path somewhere between old-fashioned, cutthroat competition and the coded cooperation of NRA, it is stated in *Business Week*. This case is of particular interest to the textile industry, since the Cotton-Textile Institute filed a brief as "friend of the Court."

"In the main, trade associations can breathe easier because of the decision," states *Business Week*. "Their main functions are not disturbed. . . . Industry noted with special interest that the open-price policy of the sugar refiners was not condemned. What the Court did ban was any requirement of adherence to announced prices. There may be price regularization but no interference with competition. Collection and dissemination of trade statistics were specifically approved in this case."

This and That

TEXTILES was the leading industry of the country in 1899 and was even more so in 1933, according to the New York Trust Co.'s bulletin. In the former year it represented 21.7% of the total employment, while in 1933 its percentage had risen to 24.4%. Obviously this includes apparel and related industries in addition to the primary textile industry. . . .

The Department of Agriculture is trying to secure information concerning the possibilities of the Rust Brothers cotton picking machine, which has been represented as being a realization of the long-deferred dream of a mechanical picker. . . .

The first official estimate of the 1935-36 cotton crop in Southern Brazil is 904,000 bales of 478 lb. each, which would be an increase of about 48% over last year's crop of 610,000 bales, but only 6% over the first estimate of the 1934-35 crop made at this time last year.

$5,000,000 Damage

to New England textile mills by flood

From TEXTILE WORLD's New England Office

THE losses of the textile industry in the flood area are very real. Leaving out the Fall River and New Bedford sections, which were not affected, approximately 70% of the New England mills were damaged. Individual losses ranged from an estimated $1,000,000 at Amoskeag Mfg. Co. down to a few hundreds. As the game of making estimates is very popular now, we will take what figures are available, take a long look into the crystal ball, and mention $5,000,000 as the total for all textile mills. Forced unemployment created another very real loss. The large mills at Lawrence alone have a daily payroll of $60,000, and most plants were forced to close two weeks or more.

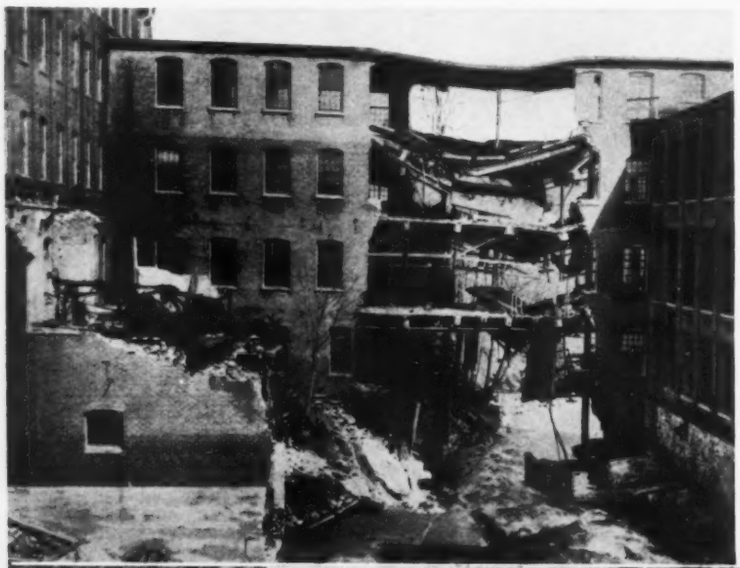
There were two crests to the flood; the first was bad, the second was awful. On March 12 and 13, water in the rivers rose to heights that approached, and in some cases exceeded, the records of the disastrous flood of 1927. There followed a few bright, warm days, and mills announced that they would reopen. Then came the rain. The second crest occurred on March 20 and 21, and was by far the worst in the history of New England.

Amoskeag Mfg. Co., Manchester, N. H., sustained the greatest single loss, both because of its size and the fact that the current is swift there. The upper boiler house was badly damaged, two fuel-oil storage tanks, approximately 60 ft. in diameter and 20 ft. high, were carried more than a mile down the river, four foot-bridges were carried away, along with connecting steam and power lines, and all the buildings along the banks were flooded above the first floor. Due to the swift current, thousands of windows were broken, foundations were undermined in many cases, and walls were knocked down by the great mass of debris that swept down the river. Some of the badly damaged buildings undoubtedly will be abandoned.

The estimated loss of $1,000,000 at Amoskeag is at best a guess as it is not known how much of the machinery can be salvaged. Bulky equipment comes through floods in pretty good shape, and needs only a thorough cleaning and some parts, but mud and water raise havoc with any delicate instruments or parts of a machine. The only way to determine the extent to which a card has been damaged, for example, is to clean it up and see whether new clothing and other parts are required. Water ruins fiber roving cans and supply items of this sort add up to quite a figure. Fortunately for Amoskeag, the dam at the head of the mill held. The water was 17 ft. deep going over the crest (previous record 11 ft.), and all down the Merrimack valley was fear that it would break.

In Lowell and Lawrence there was very little destruction of mill buildings themselves. Water flooded the basements and first floors of all mills along the river and left a half-inch coating of mud over everything. It took 600 men four or five days to get the worsted division of Pacific alone clean enough to start up some departments. Pacific as a whole was in operation Apr. 13. It was several weeks before some of the power plants could be operated again.

The situation on the Blackstone River from Pawtucket to Uxbridge was much the same as



Left—Duffy plant at Worcester ravaged by river (International News photo)

Lower left—Talbot Mills at North Billerica on the Concord.

Below—Uxbridge Worsted Co., Uxbridge, on the Blackstone.

Above—Woonsocket Falls Mills, Woonsocket.

Upper right—Wood Worsted Mills (Amer. Woolen Co.), Lawrence.

Right—Part of Amoskeag's power house withstanding the smashing currents of Merrimack River (Boston Traveler photo)

at Lawrence in that most of the damage was due to inundation rather than destruction of plant and structure. Elsewhere in New England there were a number of cases of property, as well as water and mud, damage. The foundation was undermined at the Geo. E. Duffy Mfg. Co., Worcester, Mass., and the end of the building collapsed, throwing looms and spinning frames into the river. However, the mill was reopened Apr. 2. Fire apparatus was unable to reach the Ohio Carpet Co., West Warren, Mass., in sufficient numbers and the mill was destroyed, with a loss of $125,000. The Southbridge (Mass.) Finishing Co. lost 1,000,000 yd. of cloth. The Ames Worsted Co., Southbridge, and the Nashua (N. H.) Mfg. Co. supplied their respective towns with electricity when the municipal plants failed. As flood aftermath bleacheries in the Fall River area have been working overtime on washing and drying muddy piece goods.

The floods also caused serious damage to mills in many districts of Pennsylvania, and to a lesser degree in Virginia, West Virginia, and Maryland. The most costly single loss in that area occurred at the big viscose process rayon plant of the Viscose Co. at Lewistown, Pa. This unit will be closed several months due to flood damage.

About 25 weaving, throwing and finishing mills in Pennsylvania suffered serious interruptions of operations. The affected area included Sunbury, Selinsgrove, Danville, Lockhaven, Kingston and Bloomsburg.

When all is said and done, it can be taken for granted that any plant situated on a stream, had the flood to contend with. The list serves merely as a sample.

Massachusetts:

Propper-McCallum Hosiery Co., Northampton. Water in winding and stock rooms.

Geo. E. Duffy Mfg. Co., Worcester. Loss due to collapse of part of building.

M. J. Whittall Associates, Worcester. Foot of water in woolen spinning mill.

Wm. Carter Co., Springfield. Closed for three days.

Ohio Carpet Co., West Warren. Loss by fire, $125,000.

Leicester Woolen Co., Leicester. Section of mill washed away.

Fitchburg Yarn Co., Fitchburg. Section of wall, 20 ft. wide and three stories, collapsed. Loss $3,000.

Otis Co., Bondsville. Damage estimated at $50,000.

Webster Mills of American Woolen Co., Webster. Stock and flooring damaged to extent of $100,000.

Aldrich Mfg. Co. and Charlton Woolen Co., Charlton City. Somewhat damaged.

Maanexit Spinning Co., Webster. Floor undermined and stock damaged.

Southbridge Finishing Co., Southbridge. Considerable cloth ruined.

Wood Worsted, Ayer, and Washington Mills of American Woolen Co., and print works and worsted divisions of Pacific Mills, Lawrence. Basement and first floor of mills flooded.

Lawrence Duck Co., Patchogue-Plymouth Mills Corp., Farwell Bleachery, Lawrence Dye Works, and Henry Klous Co., Lawrence. Basement and first floor flooded.

Lawrence Mfg. Co., Suffolk Mills of Nashua Mfg. Co., Boott Mills, Merrimack Mfg. Co., etc., Lowell. Flooded first floor.

Slater Co., North Webster. Machine shop carried away.

Shawsheen Mills of American Woolen Co., Shawsheen Village. Power plant flooded.

M. T. Stevens & Sons Co., North Andover. Closed for more than a week by high water.

Uxbridge Worsted Co., Uxbridge. First floor of old mill and power house flooded.

New Hampshire:

Sulloway Mills, Franklin. Cases of finished stock carried down the river.

Jackson and Nashua Mills of Nashua Mfg. Co., Nashua. Water up to second floor of Jackson plant and to first floor of Nashua unit.

Amoskeag Mfg. Co., Manchester. Loss estimated at $1,000,000.

Harris, Emery Co., Penacook. Damage to stock in process.

Maine:

Androscoggin Mills, Bates Mfg. Co., Hill Mfg. Co., and Lewiston Bleachery, Lewiston. Forced to close because of flood conditions and lack of power.

Pepperell Mfg. Co., Biddeford. Power failed.

Cabot Mfg. Co., Brunswick. Plant partially flooded and power plant crippled.

Edwards Mfg. Co., Augusta. General water damage.

Rhode Island:

Woonsocket Worsted Mills, Samoset Worsted Mills, R. I. Plush Co., and Masurel Worsted Mills, Woonsocket. Surrounded by water 4 to 7 ft. deep.

Manville Jenckes Corp., Manville. Water 9 in. deep in rayon weave room.

Lonsdale Mills, Ashton. Four feet of water in cellar.

Imperial Printing & Finishing Co., Cranston. Closed for several days.

Connecticut:

Hartford Rayon Co., Hartford. Plant closed due to water damage. Resumed Apr. 9.

Putnam Woolen Co., Putnam. Weave room flooded.

Grosvenor-Dale Co., No. Grosvenor Dale. Water entered one section of plant.

Winsted Underwear Co., Winsted. Water in boiler room.

Cyril Johnson Woolen Co. and Warren Woolen Co., Stafford Springs. Damaged.

Bigelow-Sanford Carpet Co., Thompsonville. Power plant and 1st floor flooded.

Glastonbury Knitting Co., Addison. Service interrupted.

Pennsylvania:

Viscose Co., Lewistown. Some 20,000 motors on spindles were under water which also destroyed raw material. Damage believed to be well in excess of $1,000,000.

Susquehanna Silk Co., Sunbury. Service interrupted.

Virginia:

DuPont Rayon Co., Waynesboro. Operations briefly interrupted due to employees being delayed by street floods.

West Virginia:

Interwoven Stocking Co., Martinsburg. Closed for about 10 days. Electricity off.

Berkeley Woolen Co., Martinsburg. Closed for several days.

Maryland:

Celanese Corp. of America, Amcelle. Shipments delayed by flood at Cumberland.

Textile Personalities

WHEN you receive your button signifying 45 years of continuous service with one concern, it is an achievement. Franklin W. Hobbs has quite a few others to his credit also. He is president of Arlington Mills, Lawrence, Mass., chairman of the board of the Textile Foundation, a life member of the Corp. of M.I.T., and, to mention only textile concerns, a director of Wm. Whitman Co., Acadia Mills, Monomac Spinning Co., and Nashawena Mills. He has the unique distinction of having served as president of both the National Association of Cotton Manufacturers and the National Association of Wool Manufacturers.

Mr. Hobbs would have made a good statesman. He likes to get around, keep in contact with people, and delights in being in the midst of things in Washington. His activities on behalf of tariff legislation show that he knows his way around in political circles. Prior to an automobile accident in 1928, Mr. Hobbs enjoyed golfing. He reads newspapers, magazines and books extensively, and clips items about his friends.

As far as the record goes, Mr. Hobbs was graduated from M.I.T. in 1889, served there a year as instructor in mechanical engineering, joined the Arlington Mills in 1891, and was sent to study for a time at Bradford (Eng.) Technical College. He was made treasurer of the mills in 1902 and later became president. Dartmouth College conferred the honorary degree of M. Sc. on Mr. Hobbs in 1913.

THE third generation of Hammett is in the cotton mill business, operating Chiquola Mfg. Co. at Honea Path, S. C. Lawrence O. Hammett is president and treasurer, and James D. Hammett is assistant treasurer. The accompanying photograph of J. D. was snapped in front of his office. Our photographer unfortunately was unable to get a picture of Lawrence who happened to be in Florida at the time—probably deep-sea fishing.

In addition to representing the third generation of South Carolina cotton manufacturers, these two brothers have the distinction of being among the youngest textile executives of the South. Lawrence became president of Chiquola several years ago at the age of 24, following the death of his father, James D. Hammett, Sr. Their grandfather, the late Col. H. P. Hammett, built what is now Piedmont (S. C.) Mfg. Co., and was well known as a pioneer in the industry.

The Hammett brothers attended Davidson (N. C.) College. Both are married. Lawrence is the father of four boys while James has one girl. They are active in civic affairs, Lawrence belonging to the Rotary club and James to the Kiwanis organization. Their tastes vary as to recreation. Lawrence, in addition to fishing as much as possible, likes to "fool around" with machinery, and turns out some excellent work in a workshop at his home. James is as proficient on the golf links as is Lawrence with the rod and reel, and can show a number of championship cups won at the Anderson, S. C., country club. He once shot a 70.

TALK of the velvet revival, of the strong prices and spirited demand featuring this market—and one's thoughts turn logically to June Hamilton Rhodes. Pioneer in the field of co-operative velvet merchandising, Miss Rhodes has upset many traditions in her textile career; more important, however, she has proved—and profitably for the mills—that the market for fine pile fabrics was not necessarily limited to the élite and wealthy.

Six years ago, the diminutive managing director of the Velvet Guild decided that the average American woman could be made "velvet-conscious." Her enthusiasm and confidence were infectious: the five foremost firms making apparel velvets gave her carte blanche to go ahead.

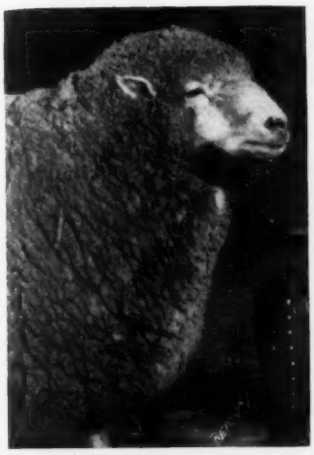
How well she has succeeded is shown in the velvet market's record; this textile branch resisted some of the worst curves of the depression and was one of the first to recover.

The experience which has served Miss Rhodes so well in popularizing velvets was acquired in a diversity of activities and an amazing quantity of travelling. Her travels include: 68 coast-to-coast trips, 22 trips to Europe and one 'round the world trip. Highlights in her non-textile career are: seven years managing director, Ruth St. Denis, dancer; and director of women's publicity for Alfred E. Smith during his presidential campaign.

Miss Rhodes attributes the success of her velvet merchandising work to bringing the velvet manufacturer and his products closer to the consumer.

In personality, she is quick, friendly, decisive. As for hobbies,—well, let her tell it herself: "Cooking is my greatest. Fond of tramping and swimming—but most of all I enjoy cooking, which to me is a fine art."

Wool Heads D-13 Program



Papers by Von Bergen and Hardy feature Washington meeting—Cotton Typp recognized

JUST a few years ago wool men were rarely seen at meetings of Committee D-13, the textile committee of the American Society for Testing Materials, and the textile industry's leading standardizing body. However, in the lobbies and corridors of the Wardman Park Hotel, Washington, March 11 to 13, during the recent meeting of the committee, charter members and others were asking, "What has happened to the wool industry? It has a live representation and is showing a real interest in standards!"

The answer to the question is a long one and we have given it before (June, 1935, page 66, and Feb. 28, 1936, page 115), but realization of what has happened came to all members of D-13 when, at the general session in Washington, more than half the program was devoted to wool matters. Two papers presented were "Buying Raw Wool on the Scientific Basis," by Dr. Werner von Bergen, of Forstmann Woolen Co., and "Scientific Breeding of Sheep," by Dr. J. I. Hardy, of the U. S. Department of Agriculture. Dr. von Bergen's important paper convinced many wool men for the first time that it is possible and practical to select raw wool samples of different origin on a scientific basis. In addition to the papers, a feature of the meeting was a motion picture, presented by Dr. von Bergen, showing the raising and shearing of sheep and hair-giving animals.

Another event which was to some extent a triumph for the wool subcommittee was the recognition given by the cotton subcommittee to the wool-sponsored Typp system as a universal basis for numbering yarns. This recognition consisted of an insertion in the "Standard Methods of Testing and Tolerances for Cotton Yarns, Single and Plied" to the effect that either the cotton or the Typp yarn-numbering system may be used. The wool subcommittee, except for the National Bureau of Standards, was the first organization to adopt the new universal yarn-numbering system after it was proposed by TEXTILE WORLD, April 23, 1932.

But the widening influence of D-13 was felt in other lines as well. One of these was the textile-processing field; and a highlight of the general session was a paper by a new member, Dr. F. G. LaPiana, of Stein, Hall & Co., on the sizing and finishing of textile fabrics. The report of the subcommittee on bleaching, dyeing, and finishing, which included a decision to establish test methods and specifications for textile chemicals, gave further evidence of activity in processing matters.

Another expansion of D-13 activities reached a climax at the Washington meeting when it was decided to establish a subcommittee on "household and garment fabrics," this to be made up largely of the representatives of consumer groups. The committee opened its doors to the ultimate consumer when it held its home-economics symposium in New York last fall; and one of the papers at the general session in Washington was "The Wearability of Silk Dresses," by Professor Mary C. Whitlock, of the Home Economics Department, University of Illinois.

Dr. W. E. Emley, of the National Bureau of Standards, was toastmaster at the banquet on Thursday evening at the Hamilton Hotel. An address of welcome to the city was made by Representative R. F. Rich, treasurer of Woolrich (Pa.) Woolen Mills, and the principal speaker was Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry,* who described new industrial products placed on the market during the depression.

The U. S. Department of Agriculture took a prominent part in the activities of the cotton subcommittee, the following papers being presented by its members: "Problem Groups in Cotton Quality Research; Factors and Elements in Cotton Yarn and Fabric Quality," by Dr. R. W. Webb; "Some Mechanical Elements Involved in Cotton Ginning," by C. A. Bennett; "Some Cotton Quality Elements as Influenced by Ginning," by F. L. Gerdes; and "Neps and Other Imperfections in Cotton," by Norma L. Pearson. At the meeting on humidity, Charles Conrad, also of the agricultural department, discussed differences in regain when equilibrium is reached from a dry or wet condition.

Following are highlights of the subcommittee reports in which definite recommendations were made. These were presented at the two business meetings presided over by Chairman Herbert J. Ball.

Light and Medium Cotton Woven Fabrics, report presented by R. T. Fisher: Changes in gray-fabric specifications to conform to "Worth Street Rules, 1936."

Wool and Its Products, presented by G. E. Hopkins: Recommendation that tentative standards on scoured content of grease wool and on woolen and worsted yarns be advanced to standard.

Asbestos and Its Textile Products, by W. H. Whitcomb (for J. M. Weaver, whose resignation was regretfully announced at this meeting): Revisions in test for cut or number.

Methods, by W. D. Appel: Complete overhauling of D-13's first standard—"General Methods of Testing Woven Textile Fabrics."

Cotton Yarns and Threads, by A. C. Clifford: Electrical yarns and single and plied yarns standards combined into one. New tolerances for atmospheric conditions. Minor changes in sewing-thread standard.

Rayon Fabrics and Silk, by H. A. Mereness, who tendered his resignation as chairman of both sections, because his responsibilities as "a Federal employee on all consumer goods" prohibit his specializing on textiles: Revised slippage test recommended to letter ballot.

Sampling. Presentation and Interpretation of Data, by A. G. Ashcroft: Recommended that instructions and examples be included in committee's biennial publication.

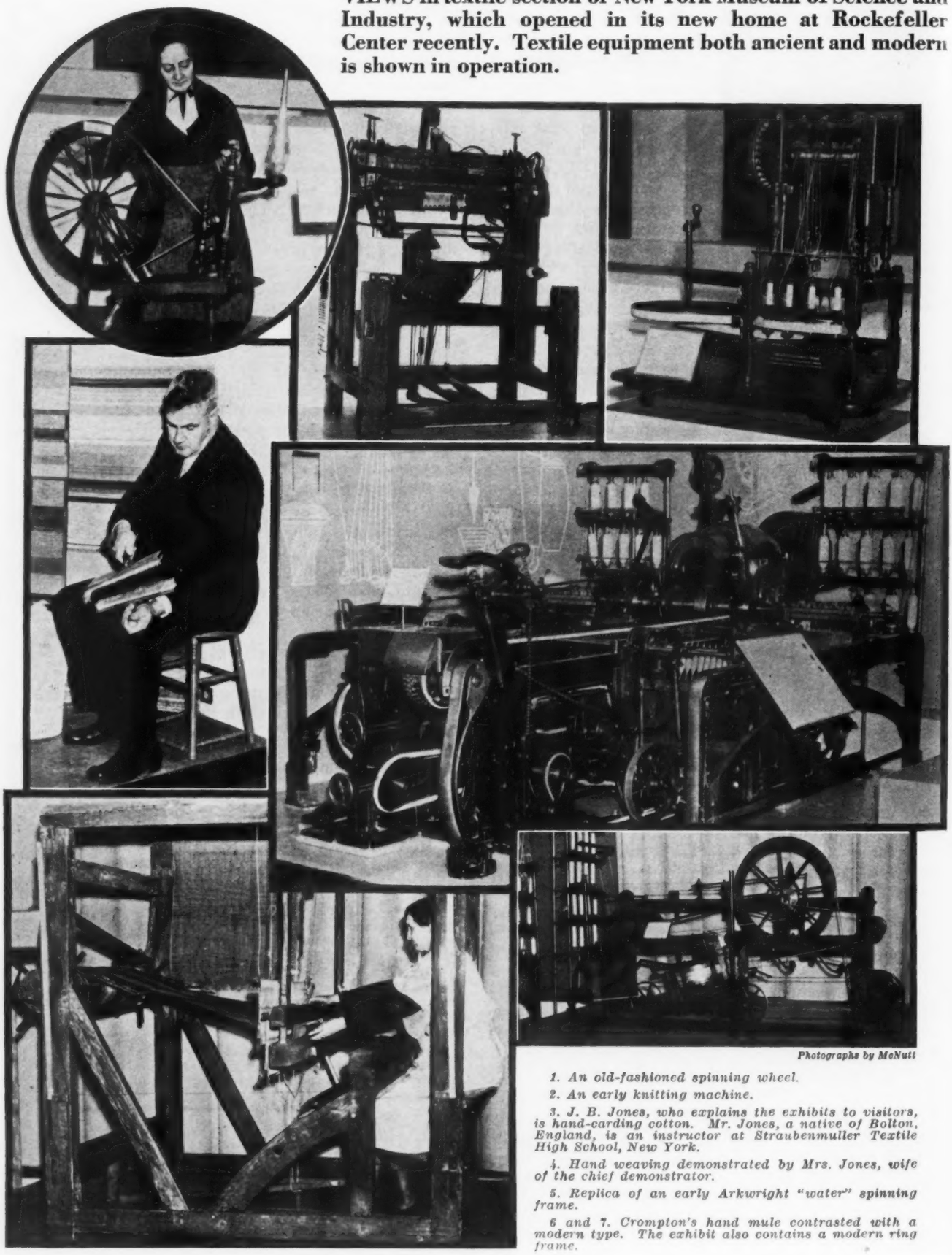
Machines, by H. J. Ball: Recommended that tensile-strength-testing jaws of any type be made acceptable, provided no more than 25% of the breaks occur within ½ in. of jaw.

All subcommittee recommendations were voted to the letter ballot of the entire committee.

Professor Ball announced that the bast-fiber subcommittee is to be reorganized into three sections (fibers, yarns, and products) by A. E. Davieau.

Textiles in the Museum

VIEWS in textile section of New York Museum of Science and Industry, which opened in its new home at Rockefeller Center recently. Textile equipment both ancient and modern is shown in operation.



Photographs by McNutt

1. An old-fashioned spinning wheel.

2. An early knitting machine.

3. J. B. Jones, who explains the exhibits to visitors, is hand-carding cotton. Mr. Jones, a native of Bolton, England, is an instructor at Straubenmuller Textile High School, New York.

4. Hand weaving demonstrated by Mrs. Jones, wife of the chief demonstrator.

5. Replica of an early Arkwright "water" spinning frame.

6 and 7. Crompton's hand mule contrasted with a modern type. The exhibit also contains a modern ring frame.

NEW SATIN SEASON

Will produce more fabric changes than have been seen recently

By John Picone

IN A VERY short while from the time I write we shall have with us the satin season; and we must expect that the converters and mill men, by hustling and bustling to get the looms mounted, will quickly bring about a state of overproduction. Novelties will be the saving of many mills caught in this predicament; and, although the season will produce the popular five-shaft satin of 60 reed and 80 picks and also the 50x96, I look for greater changes in the satin this year than have been seen for many a day.

Regarding the first-named satin, with the 60 reed, 80 picks, 12,900 single ends of Japan 20/22, and 2-thread 20/22 filling, many complaints have arisen over tight and loose marks in the fabric. In most cases these troubles are due to improper adjustment of the loom, particularly with respect to the take-up motion, and to looseness of crank arms and cradles. If all this lost motion is taken out and the take-up gone over with a view particularly to cleaning the cloth-roll friction plate and removing worn-out pinions and pinion gears, most of the tight and loose marks will be eliminated.

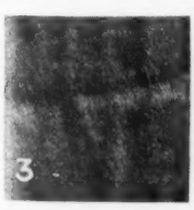
Another defect often found in this fabric is numerous mispicks caused by faulty jacks, hooks, needles, cards, and index fingers. In many instances fixers are seen working day after day on the same loom, when their time might be conserved by a complete dismantling of the dobby motion. It should be washed in gasoline, and worn-out parts replaced. I shall give more details on the care of the dobby in a later article in TEXTILE WORLD.

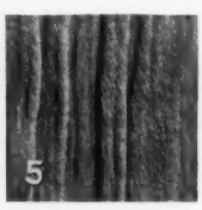
The fabric just discussed is usually woven on ten shafts, because on five shafts it has a tendency to crowd the heddles, resulting in more breakages and chafing of ends, unless duplex heddles are used.

We shall see several changes in the 50x96 satin, which is now constructed with 50 reed, 5/2 ends per dent, 11,100/2 or 22,200/1 ends per warp, and 96 picks of 2-thread 20/22. One change will consist of a slight increase in the warp ends to 22,450/1, with 100 picks of 3-thread 20/22, using 24 dents for the edge, 48/2/2.

There will also be developed from this fabric a very heavy satin construction consisting of 11,750/3 or 35,250/1, including edge, with 104 picks of 3-thread canton one twist, using a 47 reed, 5/3 ends per dent. The edge will consist of 225/3/3, which gives a neat and appealing appearance and shows up the fabric to advantage.

In the running of this fabric, which is made on five shafts with two for edges, troubles are frequently encountered, particularly with the edges, due to the fact that the warp ends have a tendency to pull over. After experiencing this difficulty for some time, we tried tying a small string around each slide bar to hold the warp





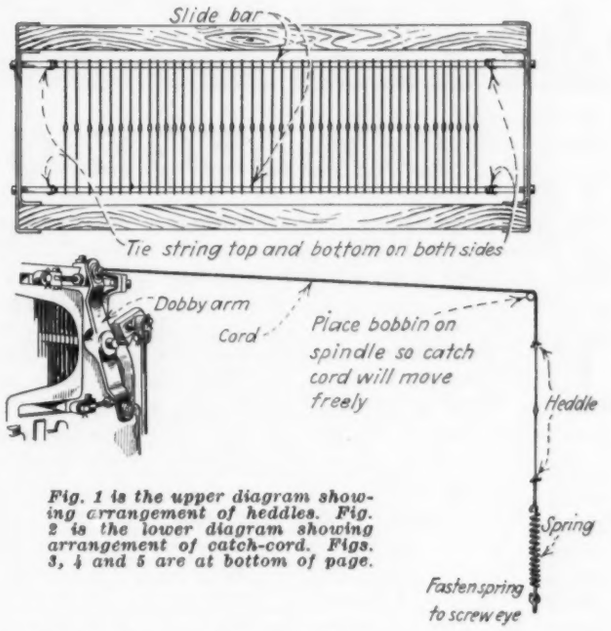


Fig. 1 is the upper diagram showing arrangement of heddles. Fig. 2 is the lower diagram showing arrangement of catch-cord. Figs. 3, 4 and 5 are at bottom of page.

heddles in place, as shown in Fig. 1; and after this was done, we had no more trouble.

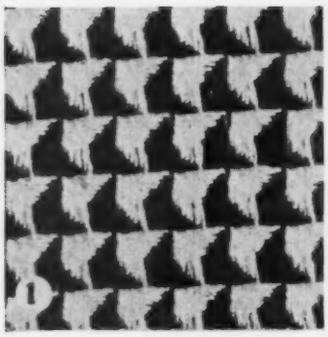
Another difficulty we ran into was that the edges were constantly weaving rough, regardless of how much trouble we took to increase the tension. The only way we could stop this was to change over one pick on the binding of the edges. That is, we were compelled to bind our edges on the box side of the loom, instead of, as usual, on the off side. In doing this it was necessary to put a catch cord on the off side to do the binding as the edge was run as two picks in the hole and every two picks the edge would bind. Any mill man who is having this trouble with his edges can make the necessary change in a few minutes by advancing his loom-card edge pegs one pick and running the catch cord off the dobby arm and fastening it to a repair heddle in the manner shown in Fig. 2.

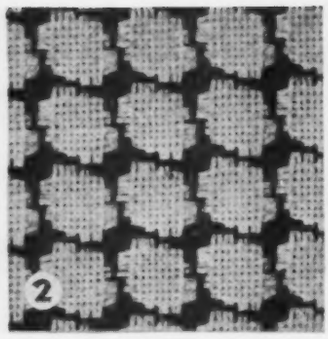
Below are listed other new satin constructions which promise to some degree to replace those constructions with which we have been familiar in the past. Figs. 3, 4, and 5 show these fabrics in the grege.

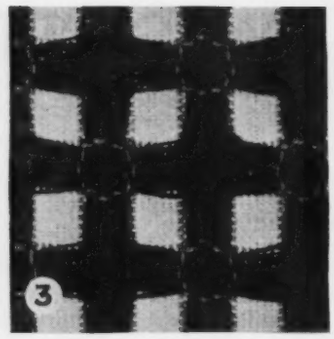
Fig. 3. Eight-shaft satin; 17,200/2 or 34,400/1 ends, including edges, of Japan 20/22; edges, 225/8/2; picks, 108 of 3-thread Japan 20/22. Sometimes run with one twist and again with two picks of S-twist and two of Z-twist.

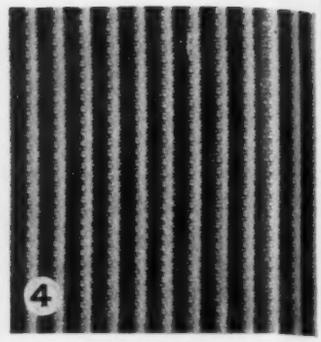
Fig. 4. Eight-shaft satin; 19,800/1, 60 reed, edges included, of Japan 20/22; edges, 175/8/1; picks, 100 of 2-thread Japan 20/22, with 2 picks S and 2 Z.

Fig. 5. Ten-shaft satin, used mostly for linings for expensive coats; 10,560/3 or 31,680/1, including edges, of Japan 20/22; edges, 225/9/3; picks, 100 of 3-thread canton, one twist. The fabric has a stripe effect. Various stripe and other effects produced on ten to fifteen shafts are at present in demand by the coat-lining people of the higher-class trade. There is also a considerable demand for the pencil-stripe satins made on sixteen shafts, and mills equipped to make them may look to a successful season.









COLLEGE GIRLS SELECT

These fabrics for the dresses they will wear at North Carolina style show

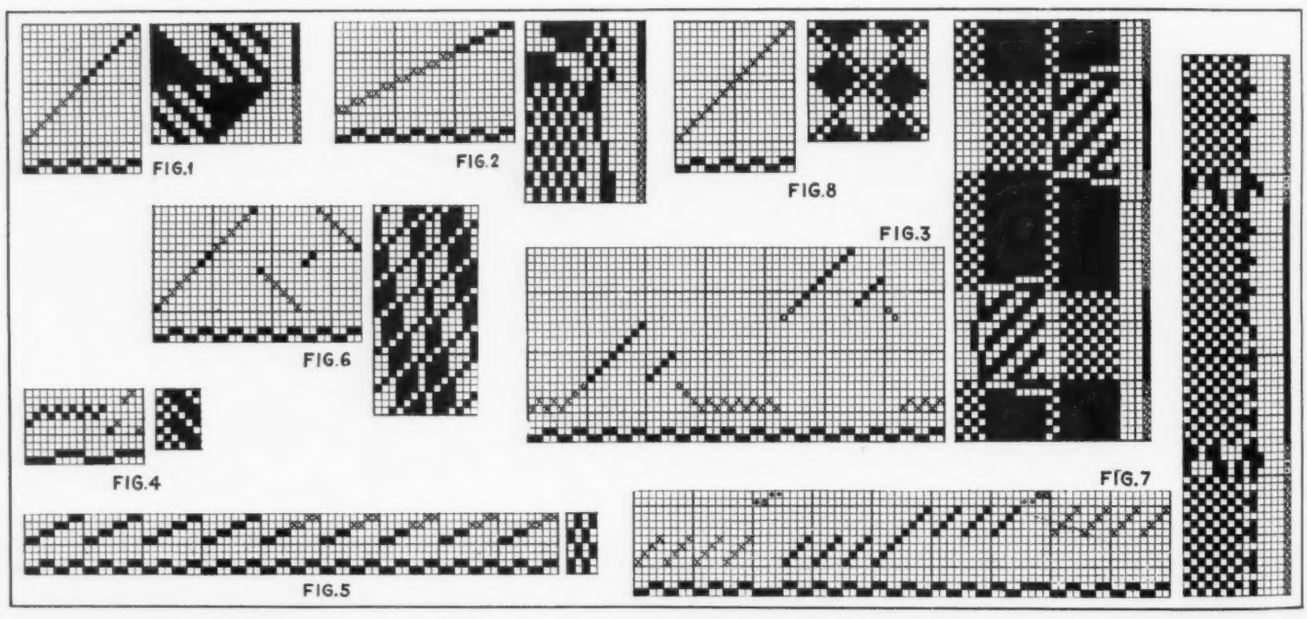
By T. R. Hart
North Carolina State College

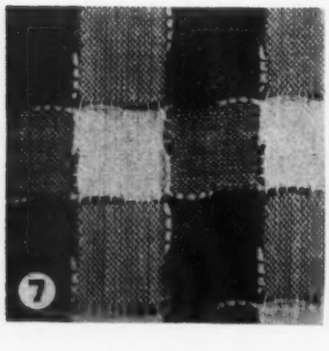
THE ninth annual style show conducted by the Textile School of North Carolina State College and the home economics departments of other institutions will be held in Raleigh on April 23. The following 11 colleges are cooperating: Appalachian State Teachers College, Boone; Catawba College, Salisbury; Elon College, Elon College; Flora McDonald College, Red Springs; Louisburg College, Louisburg; Meredith College, Raleigh; Peace Junior College, Raleigh; Queens Chicora College, Charlotte; Salem College, Winston-Salem; St. Mary's School, Raleigh; and Woman's College, University of North Carolina, Greensboro.

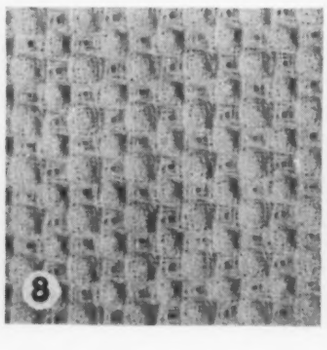
The purpose of this style show is to create more interest in cotton and rayon products and at the same time afford textile students an opportunity to study types of patterns which especially appeal to young women.

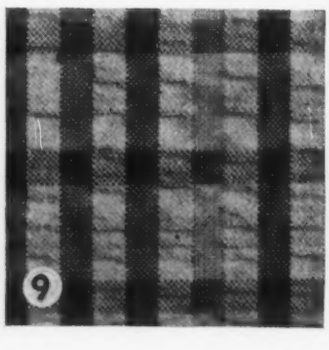
Recently scores of cotton and rayon fabrics produced by students in the Textile School were submitted to the clothing students in the cooperating institutions and each girl was permitted to select the pattern which she desired to use in making a costume to be worn at the style show.

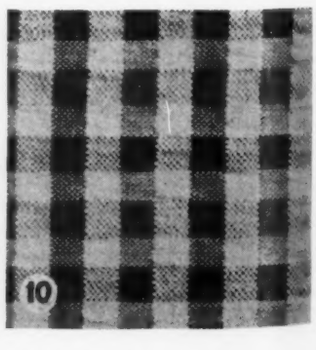
This year 172 young women will take part in this annual event. The home addresses of these girls show that they come from 92 North Carolina towns and from

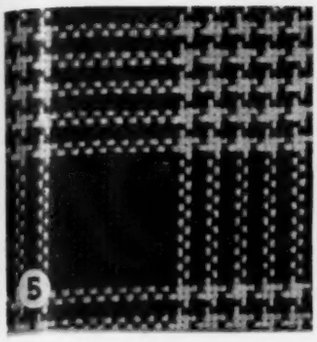


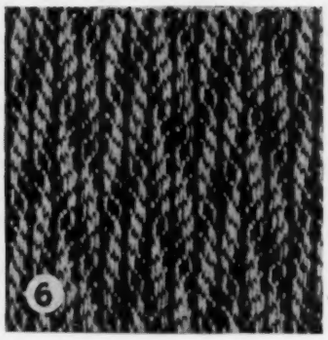












eleven other states. Thus, it is felt that they are a good cross-section of young women, and that fabrics which especially appeal to them would be popular with young women anywhere in this country. The patterns which proved the most popular this year are illustrated herewith, and their constructions are given below.

Fig. 1. Drawing-in draft, chain plan, and reed plan for suiting No. 1. Crosses represent white; and solid squares, black. Yarn, 20/2. Construction, 50x50. In this, and all other cases where it is used, the line at the right of the chain plan indicates the order in which the filling is inserted.

Fig. 2. Drawing-in draft, chain, and reed for suiting No. 2. Crosses, white; solid squares, medium blue. Yarn, 30/2. Construction, 54x54. Also popular in yellow and white.

Fig. 3. Drawing-in draft, chain, and reed for suiting No. 3. Crosses, white 60/2 yarn; solid squares, black 20/2 yarn; circles, red 20/2 yarn. Construction, 50x50.

Fig. 4. Drawing-in draft, chain, and reed plan for pique No. 4. Crosses, white; solid squares, dark blue. Warp yarn, 60/2. Filling, 150 denier white rayon. Construction, approximately 110x68.

Fig. 5. Drawing-in draft, chain, and reed for suiting No. 5. Crosses, white; solid squares, medium blue. Was picked the same as it was warped. Yarn, 20/2. Construction, 50x50. Also popular when the large solid square was bisected with red in both warp and filling.

Fig. 6. Drawing-in draft, chain, and reed for suiting No. 6. Crosses, white; solid squares, red. Filling, black. Yarn, 20/2. Construction, 50x50. Also popular when made with solid-white warp and medium-blue filling.

Fig. 7. Drawing-in draft, chain, and reed for fancy gingham No. 7. Crosses, white; solid squares, green; circles, red; and dots, yellow. White and green, 60/2 yarn. Red and yellow, 30/2 yarn. Take-up stopped for two picks every time the heavy filling is inserted. Construction, 72x72.

Fig. 8. Drawing-in draft, chain, and reed for white fabric shown at No. 8. Especially popular for coats. Generally called waffle cloth, but in reality is the Brighton weave and a variation of the honeycomb. Yarn, 20/2. Construction, 50x50.

Fabric 9. Seersucker check. Drawn in as follows:

White	12	12	12	12
Yellow	12			
Green		12		12
Purple			12	

White warp 30/2 from top beam. Colored yarns 60/2 from bottom beam. 32 reed, 2 ends per dent. Picked same as warped, but the white filling is 60/2, as is all the colored filling.

Fabric 10. Seersucker check. Drawn in as follows:

White	12	12
Red	12	
Black		12

White warp 30/2 from top beam. Red and black 60/2 from bottom beam. 30 reed, 2 ends per dent. Picked same as warped, using 60/2 yarn for all colors of filling.

Fabric 11. Counterchange gingham pattern with an overcheck. Warped and picked as follows:

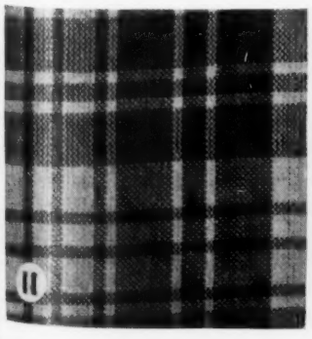
Green	20	8	20	4	4			
White	4	4	20	8	12	4		
Red						4		

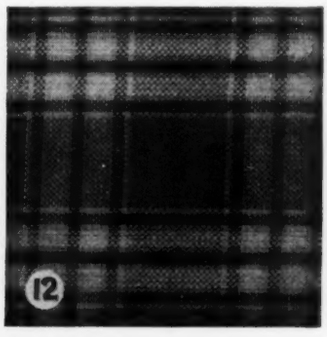
30 reed, 2 ends per dent, 60/2 yarn.

Fabric 12. Gingham pattern. Warped and picked as follows:

Scarlet	32					
Yellow	2	2	2	2	2	2
Blue	4		4		4	
White		6		6		

30 reed, 2 ends per dent, 60/2 yarn.





BREAKING THE SHED

Sometimes advisable on wool looms

By Benjamin F. Hayes

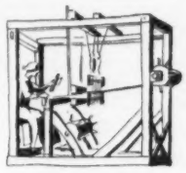
IN AN ARTICLE in the Feb. 14 TEXTILE WORLD, page 71, I explained that double reeds are sometimes used on basket weaves to prevent the warp threads from rolling together. Sometimes we can prevent this condition in basket weaves by breaking the shed. The following incident illustrates the success thus achieved:

The sample department was having a hard time with a basket weave made on a warp which consisted of a 2/30s cotton yarn running thread and thread with a woolen yarn of about 4-run. It would not work. They had already had the warp in the loom once, but had taken it out and rewound it on to separate beams.

The warp was on separate beams when I was called to see it. Two weavers had been assigned to one loom, but they were not producing very much cloth as they were constantly stopping the loom to take off bunches of wool that had formed on the cotton yarn as it rubbed against the woolen yarn. I expressed the opinion that the remedy was to break the shed.

To accomplish this, I raised the stirrup eyes which carry the harness wires to a point quite near to the top of the jacks. I also put the under stirrups near to the outside end of the jacks. It was necessary for me to raise the harness a little also. While I was doing this, I instructed the weavers to take off all bunches already formed, telling them that we would not make any more. They hardly believed me; but after the change was made, no more bunches were formed because the cotton threads no longer lay side by side with the woolen threads and they could not steal wool from the woolen yarn. We now had a small shed for the woolen threads and a larger shed for the cotton threads. Not only were two weavers no longer required to operate one loom, but one weaver could now actually operate two looms.

There are many occasions when it is advisable to break the shed. Suppose, as another example, that we have two threads making a basket weave and that between these two threads we have a silk thread for decorating purposes. If we do not break the shed, the silk thread will often become attached to one of the threads on each side of it, in which case the loom will not stop as there will be no slack thread. We now have, however, a double thread, and this will have to be taken out and sewed in again in its correct position. Sewing in such a thread is very slow and costly work, as skilled help is required. If the silk thread in this instance had been drawn through the front harness and the neighboring threads through the back harness, the results would have been equivalent to those obtained by breaking the shed, for we always have the front stirrups down and gradually move them toward the top of the jacks as we work back with the harnesses.



PER 1,000 GALLONS . . .

That's all it costs Bigelow-Sanford to purify water for wool scouring and dyeing

By E. L. Ridley* and H. R. Myers†

DURING the last few years, the Bigelow-Sanford Carpet Co., Thompsonville, Conn., has made a number of improvements designed to bring its manufacturing facilities to a high state of efficiency. One of the major items in its program was the installation of a modern water-purification plant to provide ample clear, iron-free water for wool scouring and dyeing.

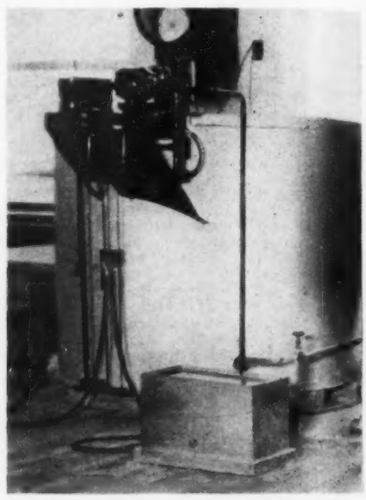
Two sources of water could be considered. One was the company's private pond fed by several brooks draining a fertile farming area. This water is free from trade waste and is relatively soft. It carries, however, varying quantities of organic color, usually from 25 to 70 parts per million, iron from 0.3 to 1.2 p.p.m., and at times considerable suspended matter. It also supports abundant growths of algae during the summer and autumn. The other source was the Connecticut River, on the bank of which the company's power plant is located. The river water is subject to wide fluctuations in hardness, color, iron, and suspended matter. It also receives much industrial waste from textile and paper mills, as well as municipal wastes from several communities upstream. Its hardness may jump from 1.5 to 4.0 grains per gal. It is not unusual for the river water to carry 1.5 p.p.m. of iron, and turbidities of 10 to 50. In general, the organic color in the river water is less than that in the pond water.

There were other important physical factors to be considered. The pond was several feet higher than the mill basement, and would therefore provide water by gravity through an existing 20-in. pipe line about 800 ft. long. The river water would have to be pumped through several hundred feet of existing piping against a total pumping head of 95 ft.

With almost every factor favoring it, the pond water was chosen as the regular supply. Experience had shown, however, that during occasional protracted dry spells the supply from the pond was inadequate, and it was decided, therefore, to install a filter plant capable of purifying either pond or river water, or mixtures of both.

The next question was the desired degree of purity for the filtered water. This is a question which frequently bothers mill executives. They know that iron in a water gives dull flat colors, instead of brilliant ones; that it frequently causes shady dyeing; and that it often shows up as streaks or stains on light goods. They know, too, that excessive natural color in the water will do similar things, and that algæ will cause scum in dye kettles and often impart bad odors to the goods. They fully realize that they cannot wash goods clean in waters carrying much suspended matter. But how much of these impurities can they tolerate? That, of course, depends on the type of goods and the operations performed on them.

Most woolen and worsted mills use from 25 to 40 gal. of water per pound of goods. This means that the impurities in the water are multiplied from 200 to 300 times in their effect on a pound of goods. Consequently, even small quantities of impurities, as reported by customary methods of water analysis, take on new significance when viewed in this light. The Bigelow-Sanford Co., therefore, demanded from its new filter plant a water having a color less than 10, turbidity 0, suspended matter 0, iron less than 0.15 p.p.m., and complete freedom from residual alumina. It was further decided to protect the mill pipe lines from corrosion by neutralizing the natural acidity of the pond water. Hungerford & Terry, Inc., Clayton, N. J., was selected to design and built a suitable filter plant to produce the required results.



Past records indicated that more water was being used than should be necessary. Hence, a careful survey was made to determine the proper needs of the mill for filtered water. This showed 3,500 gal. per min. would be required, representing a saving of 15 to 20% over former usage. (It is interesting to note that the actual demand of filtered water during the last nine months of operation has been between 3,000 and 3,500 gal. per min.) It was decided, however, to design all equipment for 5,000 gal. per min. ultimate capacity, in order to avoid costly changes later when production increases and a larger amount of water is needed.

Coagulation tests demonstrated that a mixing period of 20 min. should be provided for most efficient use of the filter alum. Violent agitation is employed in the first few bays of the mixing chamber, followed by gradually diminishing agitation to roll up a heavy, compact floc, which settles rapidly in the sedimentation basin. Common aluminum sulphate is the only coagulant required except during floods, when a small amount of soda ash is needed to compensate for a severe drop in the alkalinity of the pond water. The alum and soda are fed in powdered form by separate feeders, as shown in Fig. 1. They are automatically controlled by a Sparling meter on the inlet main, thus insuring accurate proportioning of chemical for all rates of flow.

Following the mixer is a sedimentation basin, of reinforced concrete, equipped with muffle baffles at each end to promote quiet, even flow. A period of two hours is required for the water to pass from the inlet to the outlet of this basin, during which time most of the floc and entrapped dirt settle to the bottom. By means of a sloping floor and convenient outlets, the sediment is flushed out at regular intervals to the sewer. The settled water

*Plant engineer, Bigelow-Sanford Carpet Co., Thompsonville, Conn.
†New England sales manager, Hungerford & Terry, Inc., Clayton, N. J.

flows by gravity to the filters, where final and complete purification is accomplished.

The filters are of the gravity type, built in rectangular, concrete tanks in two rows separated by an operating platform, as shown in Fig. 2. Valves for filtering, washing, and filtering-to-waste are operated from this platform. Copper tubes bring samples of filtered water from each filter and settled water from the sedimentation basin to a central testing table shown on the platform. Eight concrete filter tanks for the ultimate 5,000 gal. per min. were built, but only six of them, to give 3,500 gal. per min. present capacity, are equipped with filter sand and piping.

The filter units have a number of unusual features. Every part is designed for the purpose of keeping the sand bed clean, because it is well understood that a clean filter bed of properly graded sand will give most efficient filtration over a long period of years, while a dirty sand bed is a preliminary to a breakdown of the filter. All

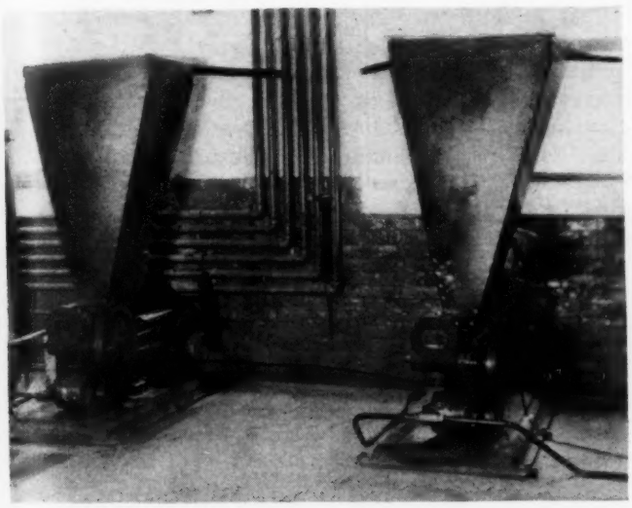


Fig. 1. Automatic feeders insure accurate proportioning of chemicals for all rates of flow.

strainer piping in the bottom of the filter is of cast chrome-nickel-iron to resist corrosion, and a full 1-in. pipe thread is provided to hold each strainer head. Special care was taken to insulate thoroughly all brass-to-iron joints, both inside and outside, to avoid blown-out strainers through electrolysis. The strainer heads are of heavy, spring brass and Monel metal, with flexible non-clogging ports. All ports discharge the wash water laterally through a coarse ballast layer to facilitate uniform distribution and to avoid any upward jets of water which might disturb the overlying gravel layers.

Above the ballast are layers of graded gravels, from coarse to fine, to support a deep bed of carefully graded filter sand. This filter-sand bed holds the impurities filtered from the water. Violent agitation of the sand is required to remove these impurities during backwashing; therefore the backwash water is supplemented by compressed air uniformly distributed through a system of brass pipes placed above the gravel bed. The mixture of wash water and air under reduced pressure rising through the sand bed makes each grain scrub its neighbors clean, and, once above the sand, carries up the loosened dirt to the wash-water collectors and thence to the sewer. Backwash water is drawn through an automatic wash-water regulator from the filtered-water force-main supplying the mill, while compressed air under proper pressure is provided by a positive-pressure blower furnished with the filters.

From the filters, the purified water flows by gravity to a 200,000-gal. clear well, where its acidity is automatically neutralized by the meter-operated pH corrector shown at the left of the alum feeder in Fig. 1. A recording, clear-well gage mounted on the operating platform keeps the operator informed of the condition of the clear well, and an automatic low-water alarm warns him of low water. Three motor-driven centrifugal pumps draw water from the clear well and send it to the mill at 70-lb. pressure. The three pumps permit efficient operation within wide limits of water demand, and also give the security of having a standby unit. They can be operated manually by pushbutton or automatically by the pressures in the force main.

Careful study should always be given in designing a filter plant to take advantage of all favorable local conditions. Such conditions at the Bigelow-Sanford mill were particularly good, and many thousands of dollars were saved by utilizing the basement and sub-basement of an existing mill building. An unusually compact and effective filter plant resulted. During its nine months of operation, it has consistently given filtered water free from turbidity, suspended matter, algæ and residual alum, with iron not over 0.1 p.p.m., and color below 5. The result of such tremendous improvement in the water supply has been reflected, not only in the carpets, but also in the morale of the dyehouse employees.

Only one operator, working eight hours per day, is required to maintain the entire filter plant in perfect condition. In fact, he has quite a number of other machines to look after in the same mill building; but all of his time is charged against the filter plant. In spite of this, the company's net cost for filtered water delivered under 70-lb. pressure at the dyehouse is only 2.1c. per 1,000 gal. This cost includes all fixed charges for depreciation and overhead, and all operating charges for chemicals, power and light, maintenance, labor, and even the cost of the backwash water.

Design and construction drawings were made by the engineering staff of Hungerford & Terry, Inc. The filter plant was built under the general supervision of the senior author of this article. All concrete construction was under the immediate supervision of C. R. Richards, construction engineer, while mechanical and electrical installation was supervised by W. H. Carrigan, mechanical engineer, all of the Bigelow-Sanford Carpet Co.

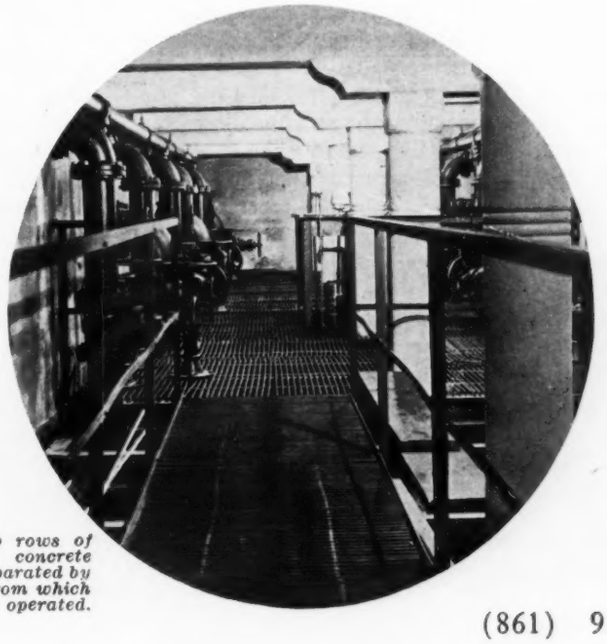
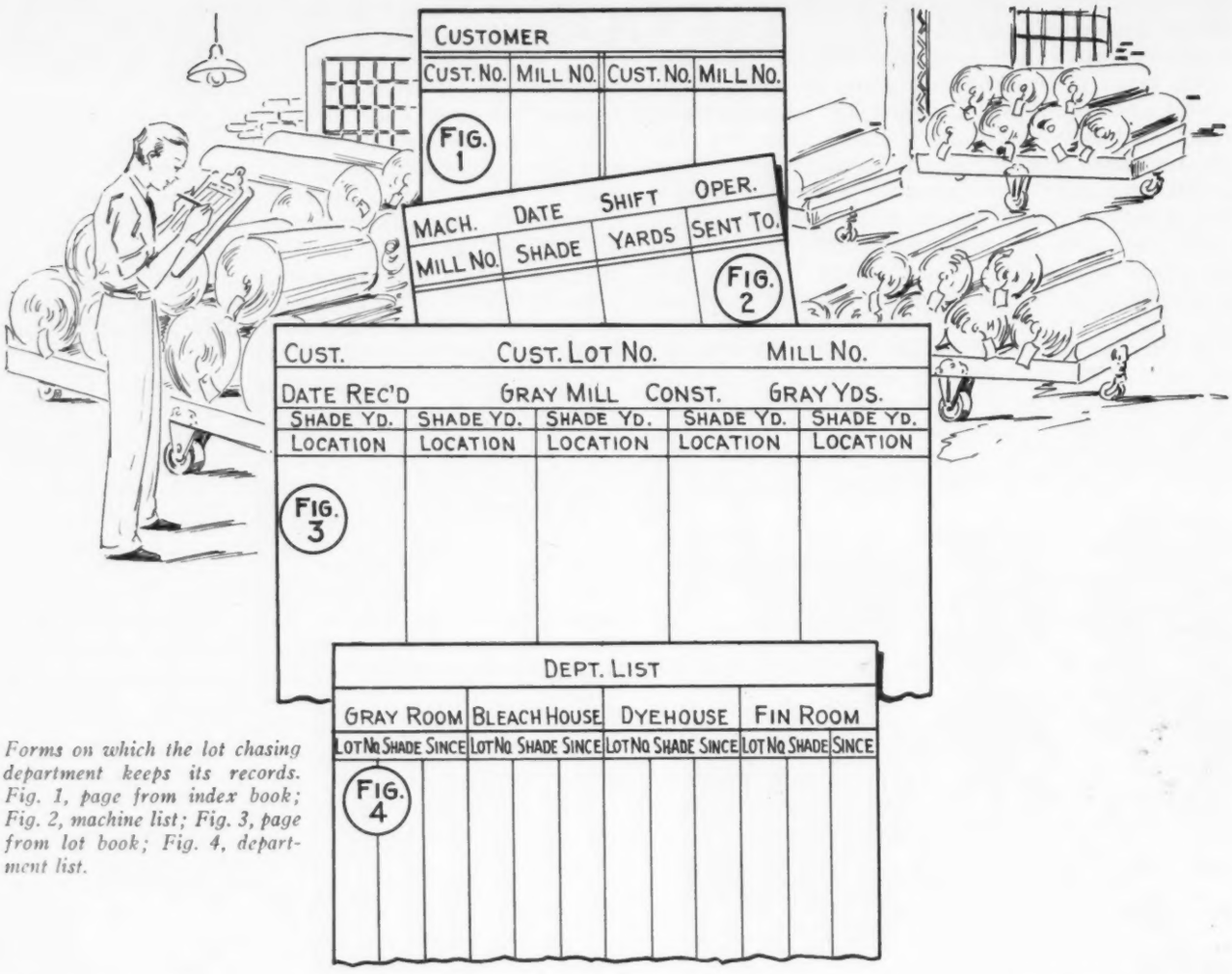


Fig. 2. Two rows of gravity-type concrete filters are separated by a platform from which all valves are operated.



Forms on which the lot chasing department keeps its records. Fig. 1, page from index book; Fig. 2, machine list; Fig. 3, page from lot book; Fig. 4, department list.

Finishing plants find good system of

By Phillip Dodge

LOT CHASING

Is real aid in planning work

IN MANY finishing plants, lot chasers are looked upon by the foreman as a necessary evil. Actually, a well-designed system of lot chasing can be of great assistance, not only to the management, but also to the various department heads. If a mill is to get the most good out of its lot chasing system, the latter should be so set up that it will automatically show how long the lot has been in the plant and in any given department and also should permit each foreman to estimate accurately the amount of work he may expect to have on hand the next day. This last is designed to guide the foreman in securing the proper amount of help, rather than to chance his being overstaffed one day and short-handed the next.

The nucleus of a good system consists of four form sheets on which to enter records, a progressive series of mill lot numbers, and one or more lot chasers—depending on the size of the mill—who take a physical inventory of the goods in the various departments at more or less regular intervals throughout the day. As the goods are laid out in the gray room, they are given lot numbers in the order in which they go into process. From this point on, the goods are known by a lot number—the lower the number, the older is the lot.

An "index book" is kept to enable the lost chasing department to determine which mill lot number corresponds to a customer's lot number. The only data necessary in this book are lot numbers, since the "lot book" contains details regarding gray mill, construction, etc. A page from the "index book" is shown in Fig. 1.

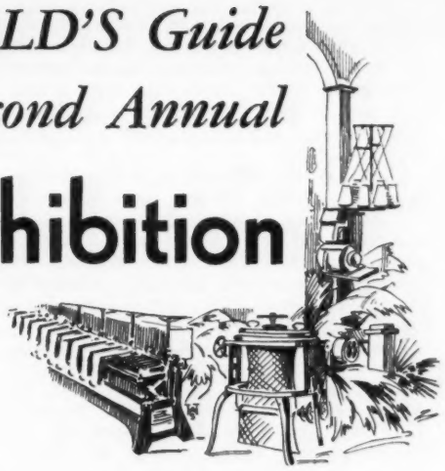
Yardage run against mill lot numbers, calculated from yardage counters on each machine, is entered by the operative in the "machine list," as illustrated in Fig. 2. This entry has the incidental advantage of recording the operative and machine which runs each batch of goods, in event it later is desired to fix responsibility or look for trouble. These "machine lists" are sent to the office after each shift, and data furnished by them are entered in the "lot book." This book, previously mentioned, is shown in Fig. 3.

From the "lot book," a "department list" is drawn up on the form shown in Fig. 4, and copies are sent to all departmental heads. Examination of the list shows each foreman or departmental head just how his own room stands, as well as the list of goods in the preceding room. Analysis of these factors permits him to forecast his labor requirements for the next day.

TEXTILE WORLD'S Guide to Thirty-Second Annual

Knitting Arts Exhibition

at Philadelphia, April 20 to 24, 1936



THE significant progress made in the technique of knit goods manufacture and the many vital problems now confronting the industry combine to lend unusual importance to the "Knit Goods Week," April 20 to 24, at Philadelphia. The 32d annual Knitting Arts Exhibition will be held as usual at the Commercial Museum, under the joint auspices of the National Association of Hosiery Manufacturers and the Underwear Institute, this marking the third year of cooperative action. The exhibits promise to be more numerous and more interesting than at any show since the depression. The total of exhibitors passed the 165 point April 1, and last-minute reservations increased that figure. The Raw Silk Committee display, which will include results of the 9-meter tests and also the raw silk color standards, is expected to prove a feature of the show. The convention schedule at the Commercial Museum follows: Wednesday, April 22, annual meeting of National Association of Hosiery Manufacturers; and Thursday, April 23, annual meeting of Underwear Institute.

A A A Silk Laboratory, Inc., New York. Booth 53A. Motion picture demonstrating methods of raw silk quality control. Rep.: C. B. Keller, K. Hillert.

Aberfoyle Mfg. Co., Philadelphia. Booths 268-269, 278-279, 287-288. Durene yarn. Rep.: J. P. Holt, E. L. Dale, J. F. McCrudden, J. A. Holt, F. W. Hancock, J. R. Kenworthy, T. H. Vetterlein, C. D. Gott, E. F. Golden, R. W. Yeabsley, C. B. Rapp, H. Lineberger, J. J. Neil, S. Keare, F. G. Miller, H. Buckley.

Abington Textile Machinery Works, Boston, Mass. Booth 143. Weavers knotters, and photos of Cook Goldsmith vacuum card stripper and own dyeing equipment. Rep.: F. W. Higgins.

Adelphia Textile Co., Philadelphia. Booth 331. Hosiery yarns—resist, decorative, and seaming and looping. Featuring double-resist dyed acetate, solid colors, and block-dyed combinations. Rep.: Jas. T. Hunter, Clarence Evans, E. B. Steinmetz.

Allentown Bobbin Works, Allentown, Pa. Booth 184. Silk, rayon, and cotton bobbins and spools. Featuring specially constructed spools with fiber heads permanently secured to barrels with double-strength drive screws. Rep.: B. Fenton Mack, H. C. Mack.

American Aniline & Extract Co., Inc. Booth 209. Textile chemicals; Featuring new method of degumming by use of Orthopol concentrate. Rep.: A. B. McCarty, T. P. Key, H. H. Kirkpatrick, F. A. Carsten, and W. P. Gudgeon.

American Bemberg Corp., New York. Booths 240, 255. Bemberg yarns and fabrics. Rep.: H. Z. Heuston, H. A. Chapell, T. H. Johnson, Mrs. Louise Huston.

American Enka Corp., New York. Booths 188-189. Rayon yarns. Featuring Englo women's seamless and full-fashioned hosiery, warp, and circular-knit merchandise. Rep.: J. A. Van Laer, H. H. Anning, and E. W. Martin.

American Safety Table Co., Reading, Pa. Booths 269-273. Ball bearing automatic clutches and tables for looping and seaming. Featuring all-steel, high-speed sewing power table. Rep.: Jos. Frankel, Louis Frankel, H. P. King, M. T. Voigt.

American Silk Spinning Co., Providence, R. I. Booth 275. Spun yarns. Show garments made from new "Shrinkless Blended Silk-N-Wool." Featuring new fall yarns for full-fashioned and half-hose and underwear and outerwear manufacturers. Rep.: L. E. Silverman.

American Silk & Rayon Journal, New York. Booth 56. Textile publishers.

American Thread Co., New York. Booths 286-287. Cotton and mercerized threads. Rep.: J. W. Kennedy.

American Woolen Co., New York. Booth 223. Machine and hand knitting yarns. Rep.: Neil MacLellan, A. Sidebottom.

American Wool & Cotton Reporter, Boston. Booths 38, 39. Textile publishers.

American Yarn & Processing Co., Mt. Holly, N. C. Booths 345, 368. Combed and carded yarns. Rep.: T. H. McKinney, Edwin Hutchison, E. J. Holbrook, E. F. Redding, E. W. Wood, Tom Moore, George Thomas, H. T. Crosby.

Edward R. Ammon, Inc., Reading, Pa. Booth 32. Inspecting equipment for hosiery. Rep.: E. R. Ammon, W. F. Geibel.

Joseph Amon, Rahway, N. J. Booth 180. Metal moistening equipment for full-fashioned machines. Featuring Humiseald units. Rep.: Jos. Amon, R. H. Therrell.

TEXTILE WORLD will maintain headquarters in booths 89-92 at the Knitting Arts Exhibition, Philadelphia, April 20 to 24. Cordial invitation is extended to visitors to make this booth their business headquarters while in Philadelphia.

Arrow Needle Co., Manchester, N. H. Booth 8. Latch needles. Rep.: G. S. Dillon, G. L. Heaton, Jr.

Atwood Machine Co., Stonington, Conn. Booths 201-218-232. Throwing machinery. Featuring new large package and high-speed single-end twisting, oil-less operation. Rep.: A. L. Lewis, R. F. Lenihan, F. Sails, J. R. Breen, I. R. Rowe, E. H. Pierce, T. Dewhurst, Harold Morton.

Bahnson Co., Winston-Salem, N. C. Booths 21-22. Bahnson Humiduct and Master Control. Rep.: F. S. Frambach.

Bausch & Lomb Optical Co., Rochester, N. Y. Booth 346. Optical instruments for study and measurement of fibers, threads, yarns, fabrics. Featuring projector for magnifying, projecting, and photographing knit fabrics, and new hand magnifiers. Rep.: W. S. Slocum, E. S. Bissell.

Boger & Crawford, Philadelphia. Booths 238-239, 256-257. Mercerized yarn. Rep.: R. C. Boger, E. T. Boger, H. H. Haff, T. F. Haigh, J. J. Nevins, C. R. Beck, W. R Rietheimer, French Campbell, Jr., W. C. Henderson.

Boshamer & Co., Philadelphia. Booth 35. Single and plyed, natural and dyed yarns, featuring soft zephyrs. Rep.: R. H. Walker, G. J. Johnson, H. M. Boshamer, C. C. Boshamer, D. R. Wilson, H. L. Greaff, R. D. McDonald, J. R. Kenworthy, R. Reynolds, F. W. Frank.

H. Brinton Co., Philadelphia. Booths 117-122. Knitting machines. 24-in., 16-feed, 11-cut PR machine, with design wheels, operating on the cylinder for making puff-stitch patterns on outerwear; 24-in., 16-feed, 9-cut PR machine for making jacquard designs on both inside and outside of fabric; 5½-in., 4-feed ribber for half-hose; 4½-in., 3-feed jacquard ribber for fancy tops, 3¼-in. single-feed ribber for striped tops. Rep.: H. S. Horrocks, J. Russell Forrest, W. H. Allerton, Seth B. Bittle.

Brugger Winding Co., Philadelphia. Booths 138-153. Rayon, raw silk, rayon-silk-worsted-cotton combination, and

special swifts; also Lastex swift suitable for all elastic yarns, vertical rayon swift for pot-spinning process and universal horizontal rayon swift on very small and large cakes. Featuring spindleless skein winder. Rep.: Albert Brugger, W. A. Dobler.

H. W. Butterworth & Sons Co., Philadelphia. Booths 58-60. Textile finishing machinery. Featuring Tube-Tex machine in operation. Rep.: H. W. Butterworth, Jr., J. Ebert Butterworth, De Haven Butterworth, Harry Lownsbury, W. E. H. Bell, Mortimer Cohn, Jean Cohn, Jules Walter.

Cannon Mills, Inc., Philadelphia. Booths 339-340. Cotton yarn. Featuring Wiscassett dyed yarns. Rep.: H. E. Aken, C. V. Albright, H. R. Barker, J. C. Bartlett, S. M. D. Clapper, Henry Crumbliss, G. H. Ellis, C. H. Fenn, M. B. Foil, G. B. Newis Lewis, Jr., C. R. MacFarland, Jr., C. F. Peffer, J. B. Pope.

Cheney Bros., New York, Booth 325. Spun-silk and novelty yarns for underwear, outerwear, and hosiery. Rep.: Webster Smith, K. B. Blake.

Clifton Yarn Mills, Clifton Heights, Pa. Booth 173-174. Novelty yarns and fancy twists. Rep.: S. Scott Stewart, C. A. Mitchell, I. A. Haigh, Walter Seidel, Martin Sandler.

Clover Leaf Mfg. Co., Honesdale, Pa. Booth 1. Bobbins, metal pin boards, steaming crates, metal reel caps, redraw brackets. Rep.: R. P. Bennett, W. A. Spencer, Jr.

Columbia Narrow Fabric Co., Shannock, R. I. Booths 147-148. Narrow woven and braided fabrics. Featuring Lastex and cut-rubber constructions, and new Mystery Web fabric. Rep.: G. P. Clark, Norman Randall, Walter Seidel, W. Barnhardt, Edw. Stroube, W. L. McDonald.

Chas. Cooper Co., Inc., Bennington, Vt. Booth 326. Knitting machinery. Featuring Cooper latch needles with non-turnable rivets. Rep.: Wm. T. Barratt, J. J. Hayes, Raymond Rogers.

Cotton, Atlanta, Ga. Booths 367, 380. Textile publishers.

Crawford Mfg. Co., Inc., New Brunswick, N. J. Booth 170. Automatic stop-motions for knitting machines; needles; parts, etc. Rep.: Frank Crawford, Jr.

J. D. Cunningham, Philadelphia. Booth 31. Representing Cross Cotton Mills Co. Cotton yarns. Featuring colored yarn for underwear and outerwear. Rep.: J. D. Cunningham, S. R. Cross, I. I. Davis.

Davison Publishing Co., New York. Booths 141, 142. Textile publishers.

Dixie Mercerizing Co., Chattanooga, Tenn. Booths 210-211. Mercerized yarns. Rep.: G. R. West, Jr., J. B. Frierson, Jr., E. R. Kimball, D. O. Blevins, S. L. Diggle, Fred Lammond, J. B. Cameron, Alexander Cameron, F. W. Frank, A. G. Symonds, E. M. Townsend, Jr., R. H. Perkins, Geo. Dalglish.

Dubied Machinery Co., New York. Booths 361, 386. High-speed full automatic links and links and combination machine; new Dux type hand machine for knitted outerwear; and hand machine for sportswear. Rep.: E. O. Spindler, Milton Wolf.

Duffy Silk Co., Buffalo, N. Y. Booths 347, 348. Thrown silk. Rep.: C. G. Duffy, Jr., Paul Hemmerich, C. Walter Seidel, C. A. Lorenz.

Duplan Silk Corp., New York. Booths 313, 314. Thrown silk and rayon. Rep.: G. Friedlander, H. H. Cannon, W. S. Wheeler, Jr., R. H. Griffith, G. E. Ward, D. L. Ryan.

DuPont Rayon Co., Inc., New York. Booths 195, 196, 224, 225. Rayon yarn, and fabrics and garments made therefrom. Rep.: C. G. Hookey.

DuPont Rayon Co., Inc., Acele Dept., New York. Booths 194, 226. Acele yarn, fabrics, and garments. Rep.: C. I. Taber.

John A. Eberly, Reading, Pa. Booth 139. Latch needles, sewing-machine needles, textile porcelains, knitting-mill accessories.

Everlastik, Inc., Chelsea, Mass. Booth 374. Elastic and garments containing elastic fabrics. Featuring new hosiery webs for elastic-topped knee-high hosiery and new elastic fabrics for wristbands on underwear. Rep.: Ralph A. Parker, Jane Wheeler.

Ewing-Thomas Corp., Chester, Pa. Booth 33. Mercerized yarns. Featuring fabrics made of Metro-shade yarns. Rep.: J. L. Rankin, David Thomas, J. J. Klumpp, H. A. Stafford, George H. Ellis, Henry Crumbliss.

W. F. Fancourt & Co., Inc., Philadelphia. Booth 212. Soaps, oils, and specialties for dyeing, degumming, delustering, conditioning, and soaking silk and rayon. Featuring new splash-proofing and water-repelling agent. Rep.: W. F. Fancourt, Jr., W. F. Fancourt, 3d, Chas. T. Harvey.

Fidelity Machine Co., Philadelphia. Booths 245-247, 264-266. Tubular knitting machines. Demonstrating complete line of ribbers under power. Featuring multiple-feed universal ribber; Fidelity-Altemus bottle-bobbin winder; and 16-carrier braiding unit for fish lines.

J. A. Firsching, Inc., Utica, N. Y. Featuring bias collarette and strip cutting machine; automatic length cutting machine and slitting machine. Rep.: J. A. Firsching, Robert A. Firsching.

Fletcher Works, Inc., Philadelphia. Booths 205-207. Throwing machinery, extractors. Featuring new model, high-speed Apex twister with unit control in operation; improved Duplex doubler twister, and 40-in. Whirlwind extractor. Rep.: O. W. Schaum, R. J. Bartholomew, W. H. Rometsch, Jr., C. W. Moore, H. N. Rahn.

J. B. Ford Sales Co., Wyandotte, Mich. Booth 307. Chemicals. Featuring sterilizer and deodorizer for textiles. Rep.: F. S. Klebart, J. F. Flaherty, H. E. Moyer, J. W. Turner.

Foster Machine Co., Westfield, Mass. Booths 301, 302, 317. Silk and rayon cone winders. Featuring attachments for oiling and conditioning yarn on winding machine. Rep.: Hubert A. Cadle, J. E. Wood, R. W. Ensign, H. E. Swift.

Franklin Needle Co., Franklin, N. H. Booths 139, 152. Knitting-machine needles.

Friedberger-Aaron Mfg. Co., Philadelphia. Booth 18A. Elastic textiles. Featuring elastic designs for hosiery in knee-length and anklet, for sewing on stocking. Rep.: Joe Stone.

General Electric Co., Schenectady, N. Y. Booths 154, 155. Textile motors, electrical equipment, heating units, Glyptal products.

General Electric Vapor Lamp Co., Hoboken, N. J. Booths 156-157. Mercury vapor lighting for all mill departments. Featuring 250-watt, high-intensity, mercury-vapor lamp and new combination Cooper Hewitt and incandescent unit. Rep.: C. F. Strebig, D. R. Grandy, W. R. Flounders, R. B. Chipman, Jr., F. Moos, L. F. Gerisch.

Grand Rapids Textile Machinery Co., Grand Rapids, Mich. Booths 144-146. Hand machine for laying up cotton or rayon fabric, Roto press for pressing sweaters and cotton underwear, all-metal scouring and dyeing machines. General upright finishes with special steam box, and swatch dryer. Rep.: W. F. Moon, W. H. Shields.

Grosser Knitting Machine Co., New York. Booths 376-378. Flat knitting machines of full automatic links-and-links type; hosiery seamers, accessories, needles. Rep.: M. Nydegger, O. Custer.

Grove Silk Co., Dunmore, Pa. Booths 9, 10. Silk yarn for hosiery. Rep.: G. J. Schautz, A. G. Schautz, G. J. Schautz, Jr., W. T. Cheatham.

Gunze Silk Corp., New York. Booths 20-20AA. Raw silk, models of experimental results on sericultural products. Featuring raw silk reeling exhibit, with Gunze system, operated by Japanese girls in costume. Rep.: C. F. Havey, Alex Van Straaten, T. Suzuki.

Hampton Co., Easthampton, Mass. Booths 179, 204. Durene and rayon yarns. Rep.: Hugh McConnell, J. S. Blodgett, R. B. King, F. B. Handy, B. H. Rehbaum, Wm. P. McCulloch, R. B. Lake, F. W. Kingsley, W. H. Smith, W. T. Forbes, Jr.

Oscar Heineman Corp., Chicago. Booths 299, 300. Silk and rayon knitting yarns. Rep.: W. J. Crummer, C. D. Gott, N. P. Murphy, P. W. Trudeau, F. E. Morey, L. Wotan, D. G. Brewster.

Hellwig Silk Dyeing Co., Philadelphia. Booth 245. Direct and resist-dyed silk, weighted and pure dye. Featuring full line of colors on acetate yarn that will stand cross-dyeing and bleaching. Rep.: W. J. Gutekunst, R. M. Gutekunst, H. C. Gutekunst, G. A. Smith.

Hemphill Co., Pawtucket, R. I. Booths 99-104. Hosiery machines and Banner fabric machine. Banner 19-independent-step, 24-color, wrap-stripe machine with standard equipment; same machine with 40-color equipment; same machine with 8-step wrap-stripe attachment equipped with high-splice, double sole and slackening device, double-sole trimmer, tuck-stitch and float-thread 3-color clocking, double-move heel-and-toe tipping, and 12-move horizontal striper; two machines with wrap in combination with 12-step reverse plating; improved split-foot machine; two machines equipped with Banner yarn compensator for feeding rubber; 19-in., 21-feed fabric machine with 28 needles per in. and 21-in., 23-feed fabric machine with 31 needles per in., both equipped with the Banner Fabricscope — a high-speed yarn-measuring device. Rep.: George MacDowell, Jas. MacDowell, H. G. Gross, Robert Quinlan, Arthur Pelkey, Herbert Gosling, John McDowell, Harold Wehry, John Holbrook.

John W. Hepworth & Co., Philadelphia. Booth 190. Looping machines. Rep.: George Keyser, J. J. Sander.

Louis Hirsch Textile Machines, New York. Booths 197-199, 220-221, 223. Knitting machines, needles, and sinkers. Arrangements can be made at booth for inspection of Kalio machines at nearby mills. Rep.: Louis Hirsch, Albert Friedmann, Geo. A. Urlaub, Erwin Ruckel.

R. Hoe & Co., Inc., New York. Booth 182. Box end printing press. Featuring fast imprinting of box end covers at

speed of 3,000 per hour. Rep.: C. B. Knudsen.

Alfred Hofmann, Inc., West New York, N. J. Booths 297, 298, 321, 322. Featuring samples produced on new single-unit machine, Type HSU. Rep.: Carl E. Weinberg, C. A. Kroenig, P. Schoenster, H. L. Wirth.

R. M. Hollingshead Corp., Camden, N. J. Booth 19. Featuring hosiery form cleaner and polish; also industrial maintenance chemical products. Rep.: S. X. Newman, Mrs. M. DuBin, H. B. Charars, Miss H. Obeck.

Hosiery Patents, Inc., Lansdale, Pa. Booth 35AA. Flexy yarn carriers for full-fashioned machines. Rep.: Benjamin Subin, Frank Weisbecker.

Hungerford & Terry, Inc., Clayton, N. J. Inversand zeolite water softener with samples of zeolites. Featuring patented copper gravel retaining screen; central control valve; and Synthesand, a new high-capacity zeolite. Rep.: D. M. Hungerford, C. Hungerford, Jr., J. S. Swartley, G. Lang.

Hygrolit Corp., Kearny, N. J. Booth 57. Yarn conditioning machine for cones and packages, BDE F3 Model 1937. Rep.: C. F. Dulken, H. E. Kresse, J. F. Winzurk.

Industrial Dryer Corp., Stamford, Conn. Booths 11, 12. Rayon conditioner and twist setter, humidifier, conditioning truck, and steaming truck. Rep.: C. M. Kitzmiller, G. D. Millspaugh, H. B. Foulder, F. W. Caesar, A. R. Breen, S. A. Morton.

Industrial Rayon Corp., Cleveland. Booths 341-344. Rayon yarns and knitted fabrics. Rep.: C. R. White, George Brooks, Wm. T. Burgin.

International Nickel Co., New York. Booths 13, 14. Mill and fabricated forms of Monel metal for use in textile plants. Rep.: E. A. Turner, C. J. Bianowicz.

Loyal T. Ives Co., New Brunswick, N. J. Booth 163. Spring-beard needles, sinkers, jacks, special parts. Rep.: Theo. Whitlock, E. A. Quint, H. W. Thomas, Wm. W. Heath, Raymond Bergen.

Jacquard Knitting Machine Co., Philadelphia. Booths 293-294. Circular jacquard knitting machines, with samples of fabric made on this machine. Rep.: H. Albertman.

Jasper-Groz Needle Co., Inc., New York. Booth 332. Latch needles made by Theodor Groz & Soehne, and Pemco dye nets made by La France Industries. Rep.: E. W. S. Jasper, E. L. Jasper, S. A. Farrand, Sidney Fenster.

Johnston Mills Co., Charlotte, N. C. Booths 246, 247. Durene combed and carded cotton yarns. Rep.: J. W. Ferguson, W. W. Peters, Wm. J. Yates, F. N. Belk, Wm. B. Phelps, R. M. Bechtel, J. S. Wilcox.

W. H. & F. Jordan Jr. Mfg. Co., Philadelphia. Booths 166, 167. Textile oils, softeners, penetrating agents, disinfectants, and insecticides. Featuring new products stable in hard water, alkaline, and acid solutions. Rep.: Canfield Jordan, H. B. Dohner, W. A. Stringfellow, E. C. Titus, R. A. Bruce, G. C. Harkins, F. T. Quinlan.

Kahn & Feldman, Inc., New York Booth 181. Thrown yarns. Rep.: N. Lewis, R. A. Adams, Joseph O'Donohue, C. W. Seidel, C. W. Causey, Jack Kahn.

Kaumagraph Co., New York. Booths 81-84. Dry transfers, embossed seals, lithograph packing, Kaumark stamping ink. Demonstrating new hand iron for transfer application. Rep.: Geo. M. Porges, S. W. Porges, A. F. Dooley, J. L. Reeves, H. A. Keech, A. D. Crawford, N. E. Griffith, D. O. Blevins.

Klumpp, Glynn & Co., Philadelphia. Booth 42A. Cotton yarns. Rep.: Joseph T. Klumpp, Martin T. Glynn, Jr., Ray Chase, Donald Brightman.

Knit Goods Publishing Co., New York. Booths 78-80. Textile publishers.

Knit Goods Weekly, New York. Booths 131, 132, 159, 160. Textile publishers.

Laconia Needle Co., Laconia, N. H. Booth 183. Latch needles, screw and rivetless. Rep.: A. B. Sanborn, H. D. Sanborn, Chas. B. Paulus, W. H. Groat.

W. T. Lane & Bros., Poughkeepsie, N. Y. Booth 309. Canvas baskets for loopers, seamers, ribbers; general and dyehouse truck, and shipping hampers. Rep.: R. T. Lane.

R. K. Laros Silk Co., Bethlehem, Pa. Booths 52, 53. Commission throwsters. Rep.: R. K. Laros, T. H. Mueller.

Laurel Soap Mfg. Co., Philadelphia. Booth 178. Textile chemicals. Featuring hosiery and underwear samples processed in latest finishing, delustering, and waterproofing compounds. Rep.: C. J. Bertolet, W. H. Bertolet, Jr., A. H. Gaede, E. W. Seasongood, C. C. Hagelgons.

Percy A. Legge, Philadelphia. Booth 355. Worsted, woolen, mohair, merinos, angora, cashmere, both French and Bradford spun yarns. Featuring "Controlastic" yarn made of tubular latex sheath with a soft fluffy fibrous core. Rep.: Chas. W. Neeld, Jr., Oliver McCurdy.

Lefier Corp., New York. Booths 73, 74. Flat knitting machine with electrically actuated design attachments.

Leighton Machine Co., Manchester, N. H. Booth 354. Knitting machines. Featuring samples from improved Leighton machine. Rep.: Alfred B. Gould, Frank C. Golden.

Lydon Bros., Jersey City, N. J. Booth 72. Twist-setting, conditioning, drying, and humidifying equipment. Rep.: J. V. Calhoun.

Wm. A. P. MacKnight, Philadelphia. Booth 308. Carded and combed knitting yarns. Rep.: Wm. A. P. MacKnight, F. H. Etherington, C. J. Swift, A. E. Davis.

Malina Co., Inc., New York. Booths 319, 320. Natural, dyed rayon and novelty yarns. Rep.: Louis Malina, I. J. Aibel.

Markem Machine Co., Keene, N. H. Booths 276, 277. Marking, printing machines used in hosiery, underwear, yarn, silk throwing, bleaching, and other textile divisions. Featuring automatic cone sticker label printer; tag marking machine; label and box printer; Presto power printer; Presto hand-operated label printer. Rep.: C. A. Putnam, C. E. Putnam.

Matthias Paper Corp., Philadelphia. Booth 312.

C. R. McGinnes, Reading, Pa. Booth 311. Combed, carded, merino, and mercerized yarns, and thrown silk. Rep.: C. R. McGinnes, T. L. Wilson, Ernest Jones.

M. J. McHale, Inc., Scranton, Pa. Booth 79-AA. Flyer blocks and wires; porcelain thread guides for 5B machines; guide holders and guides for cleaners. Rep.: M. J. McHale.

Merkel Bobbin Co., Allentown, Pa. Booth 151. Bobbins for silk and rayon throwsters and weavers; bobbin pinboards, cone boards. Rep.: W. E. Kiefer, Geo. McGee.

Merrow Machine Co., Harttord, Conn. Booths 333, 352. Sewing machines. Featuring models for overseaming, hemming and overedging knitted wear.

Clarence L. Meyers & Co., Philadelphia. Booths 295, 296, 323. Durene natural and dyed yarn, seaming and looping threads, novelty yarns, etc. Rep.: C. L. Meyers, M. M. Meyers, G. C. Ballenberg, G. E. Maurer, Maxwell Meyers, Daniel Strauss, C. E. Bender, H. W. Schrader, E. W. Fowler, H. J. Riebe.

James E. Mitchell Co., Philadelphia. Booth 318. Natural and dyed cotton yarns. Featuring hand knitting yarns. Rep.: J. J. Mitchell, Jr., R. H. Smith, Ralph Whitaker, J. J. Mitchell, 3d, A. W. Morton, Jr., B. G. Murray, Arthur Gagner, E. L. Merritt, Jr., F. S. Stover, E. E. Schwartz.

L. P. Muller & Co., Philadelphia. Booths 149, 150. Cotton yarns. Rep.: T. H. Nicholson, H. R. Penington, J. T. Miller, H. G. Harper, T. P. Cummings, H. D. Muller, J. L. Muller.

Narrow Fabric Co., Reading, Pa. Booths 241, 254. Hosiery and underwear elastics. Featuring openwork elastic, knee-length hosiery tops, and underwear waistbands. Rep.: Miss Jean Welch, Geo. Dudley, Fred Klein, I. N. Steteler.

Neva-Wet Corp. of America, New York. Booth 158. Demonstration of water resisting quality of garments treated by Neva-Wet process. Rep.: R. A. Meyer.

Onyx Oil & Chemical Co., Jersey City, N. J. Booth 219. Chemicals for boiling-off and finishing hosiery and underwear. Featuring new waterproofing compound Aquaproof-W. Rep.: Chas. D. Ehrengart, Walter Huber, Leon Brick, Elgar Brick, Jack Tresize.

Paramount Textile Machinery Co., Chicago. Booths 230, 231, 248-251. Dual-heat hosiery drying machines, forms and tables, inspection machines, looping attachments. Rep.: Henry Pope, L. H. Oswald, T. W. Prosser, P. LaMontagne, L. S. Kleinfeld, John Pope, W. H. Albertson, W. L. Coggins, O. A. Siegel, J. J. Biselx, T. K. Long, Miss Anna Donnelly.

Penn Worsted Co., Philadelphia. Booth 244. Novelty yarns. Rep.: W. T. Porter.

Permutit Co., New York. Booth 310. Water purification equipment.

Geo. B. Pfingst, Inc., Philadelphia. Booth 324. Hosiery tram silk for knitting trade. Featuring high-twist and direct-knitting yarns. Rep.: Geo. B. Pfingst, Sr., Bart Pfingst, J. P. Reynolds, J. J. Jacobs.

Philadelphia Drying Machinery Co., Philadelphia. Booth 177. Hurricane drying machinery for raw stock, skein, and warp yarns, packages, and finished merchandise; tenter dryers, carbonizing equipment, twist-setting machines, vacuum extractors. Rep.: W. W. Sibson, H. O. Kaufmann and C. H. Reumann.

Philadelphia Metal Drying Form Co., Philadelphia. Booths 168, 185. Hosiery drying and finishing equipment, Cellophane envelope fillers, tissue and Cellophane inserting machines. Featuring variable-heat electric drying forms with automatic and manual heat control. Rep.: Paul Guggenheim, Joseph Seligman, Ernest Wolff.

Max Pollack & Co., Inc., New York. Booth 274. Cotton and mercerized sewing threads. Featuring fastlock sew-

ing supplies and non-kink needle thread. Rep.: Josef Pollack, A. W. MacBride, J. D. Corbett, C. A. Warnock, C. L. Darlington, F. A. Stockwell.

T. J. Porter & Sons, Philadelphia. Booth 60 BB. Woolen worsted, mohair, alpaca, cotton, linen, rayon, and rubber yarns for hosiery and outerwear.

Proctor & Schwartz, Inc., Philadelphia. Booths 242, 243, 252, 253. Boarding machine. Featuring automatic devices for imparting special finish to long, short, and medium-length hosiery after leaving boarder; also new hard finish on hosiery boards and new method of equalizing drying of sheer or other weight stockings throughout length. Rep.: C. T. Griffith, Chas. S. Tiers, H. B. Lex, Wm. J. Merrigan.

Queens Machine Corp., Brooklyn, N. Y. Booths 88A-88D. New type automatic links-and-links machine equipped with selective automatic rack. Rep.: Michael Zimic, Jack Schneider, Wm. Fenster, Miss Mary Zimic.

Reece Button Hole Machine Co., Boston. Booths 335, 336. Buttonhole machinery. Featuring adjustable fly bar machines for sweaters and other knitwear making eyelet-end or straight buttonholes; Varsity cord- and thread-trimming machine; Royal 101 series machine adapted for underwear; rapid round-eyelet machine; high-speed, single-thread machine; new cut-before buttonhole machine. Rep.: F. A. Reece, Jr., J. H. Pikul, F. O. Paul.

Robert Reiner, Inc., Weehawken, N. J. Booths 359, 360, 387, 388. Samples of hosiery produced on new single-unit Combi machine; warp knitting machines. Featuring tricot machine operating at 450 courses per min. Rep.: Robert Reiner, Fritz Lambach, Ferdinand Loeffler.

Robaczynski Machine Corp., Brooklyn, N. Y. Booths 129, 130, 161, 162. Links-and-links flat knitting machine.

Rochester Engineering & Centrifugal Corp., Rochester, N. Y. Booths 213, 214. Hosiery dyeing machine with stainless steel tub and cylinder, two horizontal partitions, four doors, four compartments, motor drive with individual control; Monel metal dyeing machines and extractors. Featuring spot-welding of cylinders of dyeing machines. Rep.: R. C. Caine, P. B. Compton, C. F. Fischer, H. C. Rembold.

Rose Mills, Inc., Philadelphia. Booths 164, 165. Novelty twisted yarns; also straight twisting. Rep.: H. G. Schnitzler, A. G. Adams, Paul Barker, B. G. Weil.

Royersford Needle Works, Inc., Royersford, Pa. Booths 350, 351. Needles, sinkers, dividers, etc. Rep.: Ferdinand Heller, Fred Heller, R. W. Breidenbach.

Russell Mfg. Co., Middletown, Conn. Booth 279. Elastic fabrics for underwear, hosiery, and specialty garments. Featuring new "Knee-elastic" designs for knee-length hosiery, Mystery web, elastic webbing for underwear, woven elastic. Rep.: P. L. Howard.

St. Joseph Iron Works, St. Joseph, Mich. Booths 69, 70. Textile machinery. Featuring St. Joe automatic transfer machine which also serves as table for banding and boxing the folded stockings after stamping. Rep.: W. S. Moore, C. H. Hatch.

San-Knit-ary Textile Mills, Philadelphia. Booth 38. Knitted cotton nets for use by hosiery dyers and by silk mills for boil-off. Featuring special fabrics for protecting fine chiffon hosiery during shading process. Rep.: J. E. Casper.

Sauquoit Silk Mfg. Co., New York. Booth 50. Silk hosiery yarn. Rep.: M. A. Schoettle, Thomas Cowan.

Scholler Bros., Inc., Philadelphia. Booths 215, 216. Textile chemicals, soaps, softeners, sulphonated oils, boil-off oils, finishes, and specialties. Featuring combination dull, spot-proof, and water-repellant finishes for hosiery rayons and silks. Rep.: Geo. Pickering, E. S. Atkinson, J. F. Noble, L. M. Boyd, F. C. Scholler.

Harry Schwartz, Brooklyn, N. Y. Booth 36. Novelty knitting yarns. Rep.: L. Engel, D. Schwartz, H. Schwartz.

Scott & Williams, Inc., New York. Booths 105-116. Circular knitting machines for plain and fancy hosiery for men, women, and infants; special machines for knitting underwear and special fabrics. Featuring 25-step K spiral gussetoe machines in 300, 320, and 340 needles and equipped with elastic welt and gusset square heel attachments; complete line of half-hose machines, mostly HH type, and including HH 25-step spiral which by the float stitch method makes fancy half-hose with mock wrap Clox and all-over float and striped patterns; the HH-NRP machines producing reverse-plaited fancy patterns and the English foot bottom feature; new coarse-gage plain HH machine with striper for lumberman's socks; improved Model ES for wrap type fancy hose; HH-PW machine which has facilities for 24 wrap yarns; B type infant's machine; new automatic double-butt, tuck-rib machine for producing a great variety of tuck stitch patterns on underwear and special fabrics. Rep.: F. W. Smith, W. L. Toy, H. J. Kelly, D. J. Faucette, W. Houseman.

Sees & Faber Co., Inc., Philadelphia. Booths 15-17. Hosiery mill supplies. Featuring new back stop compact, and new friction leather clamp designed to hold all styles and sizes of friction shoes. Rep.: R. W. Sees, H. Schwartz, J. Dietrick, A. Beetle, F. Buckley, E. Sees, R. Reuther.

Singer Sewing Machine Co., New York. Booths 191-193, 227-229. Sewing machines mounted on three different types of power tabling, all equipped with new Singerlight fixture. Featuring high-speed lockstitch machines with capacity of 4,500 stitches per min., two types of feed-off-the-arm machines—231-1 two-thread chainstitch, and 134-W-3 compound-needle-feed lockstitch; variety of machines for knitwear and hosiery trade. Motors, generators, fans, etc., manufactured by Diehl Mfg. Co. Rep.: H. C. Morehouse, Messrs. Peak, Stone, Wood, Mohne, Baiter.

R. L. Sjostrom & Co., Inc., Lawrence, Mass. Booths 389-390. New cooling and conditioning machine for woven and knitted cloth, new machine for producing suede finish on knit goods. Rep.: R. L. Sjostrom, M. M. Cunningham, A. Provencher, Stanley Goldsmith.

Smith, Drum & Co., Philadelphia. Booths 23-30. Hosiery and skein dyeing machines, hosiery inspection forms, double-sole thread cutters. Rep.: H. S. Drum, R. D. Howerton, W. C. Dodson, J. E. MacDougall.

A. M. Smyre Mfg. Co., Gastonia, N. C. Booth 44. Novelty and specialty yarns. Rep.: H. T. Crosby, W. G. Thomas, C. L. Miller, C. M. Patterson, R. D. McDonald, Stanley Porter, C. H. Potter.

Southern Textile Machinery Co., Paducah, Ky. Booths 329, 330, 356. Dial loopers, cylinder loopers. Rep.: J. T. Balthasar, R. N. Parkin, Chas. Holcomb.

Standard-Coosa-Thatcher Co., Chattanooga, Tenn. Booths 202, 217, 233. Durene yarns, sewing threads. Rep.: J. S. Verlenden, R. J. Mathewson, W. H. Thatcher, M. A. Henderson, Chas. F. Smith, J. P. Reckmam, Chas. D. Harris, E. R. Dillmore, Wm. M. Hall, W. S. Lawson, Geo H. Greene.

Standard Oil Co. of Pennsylvania. Booth 60AA. Textile oils and allied products. Rep.: John Klopp, Snowden Ebling, C. N. Watson, M. W. Collins, Jr.

Standard-Trump Bros. Machine Co., Inc., New York. Booths 105-116. Machinery for making men's and children's plain, fancy and English broad-rib, plain and fancy half hose. Featuring 80W shog machine with and without multiple wrap-needle attachment; machine has 80 wrap-yarn fingers and can make patterns up to 25 steps; Model H in 70 gage, equipped with six-color striper; Model H striper fitted with new Crinkle type rubber lay-in attachment; Komet machines made by Bentley Engineering Co., Leicester, England, for knitting men's and children's broad-rib hose. Rep.: See Scott & Williams.

A. M. Tenney Associates, Inc., New York. Booths 4-7. Acetate yarns manufactured by Tennessee Eastman Corp., knitted fabrics and garments made with Eastman acetate yarns. Featuring Eastman upholstery fabric, summer suitings, spun staple, and black yarn, and Sheentec transparent glass curtains. Rep.: C. C. Mattmann, Jr., M. L. Phelps.

Textile Banking Co., New York. Booth 71. Textile factors.

Textile Machine Works, Reading, Pa. Booths 261-265, 282-286. Samples of hosiery produced on Reading full-fashioned machines. Featuring a 24-section 45-gage full-fashioned knitting machine in operation. Rep.: N. E. Richards, R. W. Weaver, E. A. Shoemaker, Henry Printz, Paul Kroener, E. Kalbach, L. Thun.

Textiles, Inc., Gastonia, N. C. Booth 203. Cotton, spun-rayon, and wool mixture yarns. Rep.: A. W. Latta, J. T. Craig, A. A. Dinsmore, Jr., A. W. Latta, Jr., J. A. Whelan, H. D. Skinner, L. F. Warren, H. G. Dolliver, Geo. T. Hutchison, P. H. Thompson, G. S. Johnston, S. G. Haigh.

Textile World, New York. Booths 89-92. Textile publishers.

Torrington Co., Torrington, Conn. Booths 270-273. Latch and spring-beard knitting-machine needles, sewing-machine needles, ball bearings, full-fashioned sinkers and dividers. Rep.: W. C. Wiechardt, H. D. Blake, Jr., Clarence Rowe, W. C. Thompson, L. J. Ross, W. L. Morgan.

Tubize Chatillon Corp., New York. Booths 357, 358. Rayon yarns, knitted fabrics and garments. Rep.: E. H. Bogardus, E. D. Bryan, J. R. Morton, L. F. Smith.

Union Special Machine Co., Chicago. Booths 266, 267, 280, 281, 303, 304. Sewing machines for hemming undershirts, attaching cuffs to union suits, seaming undergarments, seaming on lightweight fabrics, attaching split-tube borders to undershirts and rayon garments, hemming bottoms and simultaneously inserting elastic in bottoms of bloomers, attaching elastic to tops of knee-length

(Continued on page 105)

Going South?

By George W. Taylor
The Wharton School of Finance and Commerce
University of Pennsylvania

Some units may improve position thereby, but re-location is no automatic solution

◆ Dr Taylor needs no introduction to our readers. The record of his long, disinterested and brilliant service to the hosiery industry is in itself ample assurance that in the accompanying article he considers objectively and without sectional bias one of the most controversial subjects facing hosiery manufacturers. His analysis of the facts underlying actual and rumored migration of full-fashioned machines represents a most important and timely contribution.—Editor.

IT IS a fact that "good old days" really existed in the full-fashioned hosiery industry not so many years ago. But many manufacturers who not so long ago paid their knitters $125 per week and more, and who accepted orders that provided profits of several dollars a dozen, have been recently faced with the necessity of working harder than ever "to meet a part of depreciation." Not only do they work harder with meager results, but manufacturing has become a procession of difficult problems. During the last several years, for instance, these manufacturers have been tormented by silk twists and prices, a continuous labor problem, the need for new attachments, code regulations, and a host of other new factors.

The net result of battling these changed conditions has been a steady depletion of working capital, especially for many northern mills. Is it any wonder that the managements of these mills engage in wishful thinking? "Move to the South and leave your troubles behind," begins to seem reasonable, especially when moving to the South is made to appear as involving principally substantial freedom from rent and taxes, lower power costs, and the opportunity to employ labor that abhors organization.

Of course, all the talk about full-fashioned mills "moving South" cannot be explained away by the assumption that some form of escape complex is at work in the subtle fashion which may only be described by the psychologist. There are two very tangible and measurable urges that make the move to the South appear practical to the harassed northern manufacturer.

In the first place, it is evident that the southern branch of the full-fashioned industry, within recent years, has greatly increased its number of machines in place, as well as its relative importance in the industry. Second, financial statements indicate that the operations of southern full-fashioned hosiery mills since 1929 have been generally profitable, while operation of northern mills during that period have generaly resulted in losses.

The natural inference to be drawn from the two tangible factors just mentioned is that southern full-fashioned hosiery plants have had lower costs of operation than their northern competitors. Principally, these lower costs arise from the fact that in general the southern knitter operates a more modern and a more productive machine at a lower hourly and weekly wage than the northern knitter. Southern management achieved that end through successful training of employees, and by providing necessary supervision and specialization of tasks as an aid to its less skilled knitters. This has been accomplished through a process of gradual growth of southern plants and of the southern industry.

That full-fashioned hosiery mills located in the South have been more profitable than northern mills within recent years, is a fact that has strongly influenced the investment of new capital in the industry. It does not follow at all, however, that any northern mill that has been losing money can automatically show profitable operations if it moves its equipment South. Rther, it follows that the northern mill can improve its position by moving South, only if the causes of high costs of operation in the North can so be eliminated.

In this connection, it is altogether too easy to reach the fallacious conclusion that the sole disadvantage of the northern manufacturer is that his direct labor costs average 50c. per dozen above the southern manufacturer, and that his total cost could automatically be reduced by this amount as a result of moving South. Such a conclusion unduly minimizes the cost of moving, and the employee training problems that are involved. It usually overlooks two facts: (a) that a considerable portion of the northern equipment is old-fashioned and (b) that certain types of northern management are ill-adapted to southern conditions.

The Facts in the Case

While the full-fashioned hosiery industry has grown *in* the South, it has not moved *to* the South to any appreciable extent. This distinction must be kept clearly in mind in considering the possibilities of a general relocation of the industry. Accordingly Table 1 has been prepared to summarize changes in the localization of knitting machines in the full-fashioned hosiery industry during the last seven years.

It is possible to call attention to only a few salient features of that tabulation. The steady growth of the southern branch of the industry since 1929 has provided a 250% increase in its number of machines in place. While the machines in the Philadelphia economic area accounted for one-third of the industry's equipment in 1929, they represented but one-fourth of the total in 1935. However, the decrease in relative importance of

TABLE 1—Number and Percentage of Full-Fashioned Knitting Machines Classified by Producing Districts

Producing District	March 1, 1929		March 1, 1932		July 15, 1933		April 15, 1935*	
	No. of Machines	% of Total	No. of Machines	% of Total	No. of Machines	% of Total	No. of Machines	% of Total
Phila.	3,928	33.0	4,534	30.3	4,111	27.2	3,850	25.0
Other Penna.	3,381	28.4	4,071	27.2	4,715	31.2	4,928	32.0
Total Pa.	7,309	61.4	8,605	57.5	8,826	58.4	8,778	57.0
West	1,738	14.6	2,260	15.1	1,965	13.0	2,002	13.0
N. Y.-N. J.-New Eng.	2,024	17.0	1,990	13.3	1,844	12.2	1,694	11.0
South	833	7.0	2,110	14.1	2,478	16.4	2,926	19.0
Total	11,904	100.0	14,965	100.0	15,113	100.0	15,400	100.0

*Preliminary estimates; subject to revision.

the Philadelphia market was accompanied by a growth of the industry in other Pennsylvania cities and towns. The result has been a slight decrease in the relative position of the Pennsylvania area as a whole, but a shift in location from Philadelphia to the smaller towns in Pennsylvania.

An analysis of the Philadelphia situation shows that 38 full-fashioned hosiery plants have moved from that city between 1929 and April, 1935. Almost without exception, they were small plants. Four of these 38 mills moved to southern locations; the balance moved to smaller towns in Pennsylvania or New Jersey. Of the four plants that moved to the South, it can be said that at least two did not achieve profitable operations as a result. The growth of the southern district since 1929 has been characterized by an expansion of older but smaller plants rather than by an influx of new producing units. This is of extreme significance as an indication that the training of operators in the South has been a gradual process, as distinct from the mass training that is required when an entire plant of any size is relocated.

The Trend in the Future

Certain of these trends that have been developing since 1929 will probably continue with some logical modifications. The movement of smaller plants from Philadelphia will likely be supplanted by a minor movement of smaller Pennsylvania plants to the South. The scrapping of equipment that has been significant in the New York-New Jersey and New England districts will probably become of extreme importance to the Philadelphia and Pennsylvania district in coming years. There are no indications that the problems of the northern manufacturer, or of the industry as a whole, would be solved by a wholesale exodus of northern plants to the South. The northern portion of the industry faces a future that involves obsolescence and scrapping of equipment, at a time when replacements cannot or will not be provided.

It is one thing to install new equipment in the South, as an expansion of a going concern with trained employees available; it is something quite different to move South with a sizeable mill having relatively old equipment which can scarcely bear the additional capital investment incident to moving. Of the approximately 2,700 machines of 39-gauge types in the industry, approximately 68% are located in Pennsylvania, while less than 8% are in the South. About 70% of all the 18-section machines of the industry are to be found in Pennsylvania.

Since 1929, about 20 Pennsylvania plants have been reorganized in a manner that led to a revaluation of equipment and a reduction of overhead costs of operation. In most instances, the older type of equipment was revalued, and often on two or more successive occasions. While this indicates that machines are well on the road to being ultimately scrapped, this revalued equipment represents a major problem to the industry. It cannot be practical to re-locate such machines in the South. So, as new capital flows to the South, older equipment in the North will be scrapped without being replaced. It seems most likely that the major relocation of the full-fashioned hosiery industry will be accomplished by such a gradual process rather than by means of a rapid moving of machines.

Of course, there are many efficiently managed northern plants which also have modern equipment on which higher operating costs place them at a disadvantage in competition with the South. Why is it not logical to move such plants to the South? Aside from the cost of moving, an immediate program for training employees must be contemplated. Under the best circumstances, this is costly as it is unlikely that a smooth running unit can be attained in less than three years after moving of even a medium size plant.

This training investment cannot be made with the thought that upon its completion, so-called minimum wages will be paid. It should be fully recognized that wages paid in southern full-fashioned hosiery plants are, in most instances, relatively high in comparison with other southern industries. Average earnings of full-fashioned knitters in the South, as a whole, approximate $30 per week. In some southern plants, average earnings of footers exceeded $40 for a 40-hour week, and in some individual cases run in excess of $50 per week. While these earnings are considerably below the northern average, they are distinctly not at any so-called sweat-shop level. In addition, it appears that indirect labor costs per dozen are higher in southern mills.

For a northern full-fashioned plant to move its modern equipment to the South represents, in the final analysis, an added investment for moving equipment and training employees with the expectation that, if a good mass-training job is performed, savings in labor cost may finally be effected. The temporary advantages offered by some southern communities in the way of tax, rent, and power inducements may be lightly dismissed. In efficiently operated northern plants, taxes and rent combined account for less than $0.05 per dozen of the cost of manufacture, while heat, light, and power charges make up for $0.05 to $0.06 per dozen. Any possible savings along these lines can scarcely counterbalance the disadvantages of southern location in being relatively distant from the silk and hosiery markets.

Consideration must also be given to the possibility that moving South and successfully training a staff of trained operators, even within two or three years, may not finally provide the labor cost saving that is expected. It is not probable, but it is possible, that union piece-rates in the full-fashioned industry may be substantially revised within the next few years. It seems to be a certainty that the next few years will witness extensive efforts at unionizing the southern full-fashioned hosiery worker. While the odds are distinctly against any widespread success to the union in these endeavors, it goes without saying that mills moving from the North to the South will face a major part of such a unionization drive. Even aside from possible results of unionization efforts, it is a fact that the industry experience since 1929 shows a distinct narrowing of the gap between wages paid in the North and those paid in the South. While in 1929, southern hourly earnings were 40% of those paid in Philadelphia, they now represent approximately 70% of the Philadelphia average.

It seems, therefore, that the problems of northern full-fashioned hosiery manufacturers cannot be automatically met by packing up and moving to the South. It is perhaps possible for some well-managed small units to improve their position by so moving, and by properly adapting management procedures to the changed conditions that they will meet. Moving to the South cannot make efficient operating units out of mills with obsolete machines, nor can poor management succeed any better in the South than in the North.

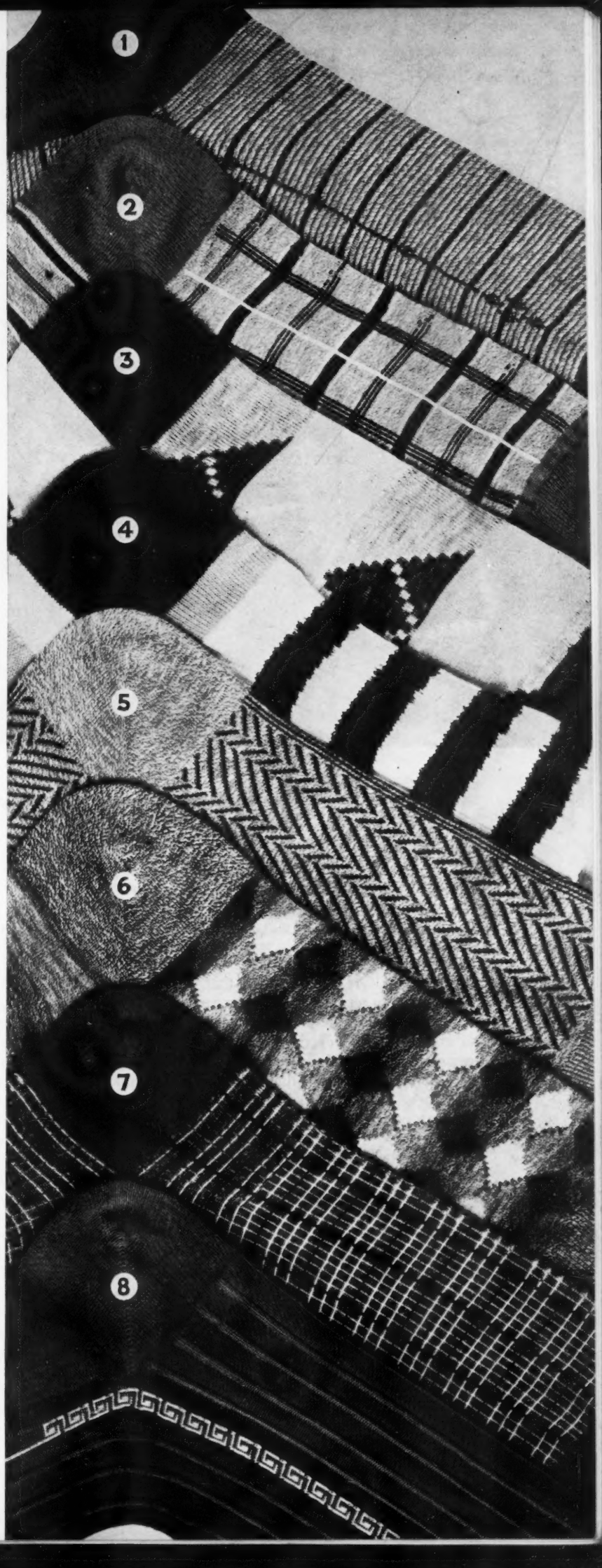
Contrary to the naïve belief of many, a relocation of the industry in the South cannot of itself bring a return of "good old days."

New Half Hose...

Designers introduce many original patterns to the 1936 market

IN RECENT years at least four things have stirred half-hose designers to new heights in the development of original, elaborate, and, to put it mildly, colorful patterns. One of these is the departure of the knickers and arrival of the slacks, which have not only given the designer an extended sport trade to which to cater, but have introduced a fashionable seasonality into men's half hose almost entirely missing before. A second influence, although due possibly to the slacks vogue, is a growing receptivity among men to the idea of wearing bright colors. Third, there can be no question that the greatly increased patterning versatility of machines (one of the great trends in knitting technology of recent years) has stimulated the designer to bolder pioneering. And finally, the improvement in living standards has reinstated the idea among consumers of purchasing hosiery for the sake alone of larger and more varied wardrobes.

Inspection of the hose introduced to the 1936 market shows that recent trends are continuing. The samples illustrated herewith, while not representative of the extremes, are typical of the lines expected to have widest appeal. (Other examples appeared in the Annual Review and Forecast Number, Feb. 28, page 100.)



1. Fine-lisle full-fashioned hose in white, green, and gray horizontal stripes, plus a green clock. Horizontal stripes are typical of most full-fashioned patterning, and the clock is of course embroidered on the fabric after knitting. Retails for $1.00.

2. All-lisle short sock known as the "Ev-R-Up." Brown and white check (with vertical stripes wrap knit). Rubber threads covered with white yarn to show as three horizontal bands when hose is worn. Retails for 50c.

3. The still-popular argyle diamond knit on 180-needle 12-step plating machines of developed ingrain mercerized and unmercerized cotton. Various color combinations. Intended primarily to be worn with light-color suitings. Retails for 35c. (Light half of diamond invisible in photo.)

4. Crew sock in wide blazer stripes knit on 136-needle knitting machinery of developed ingrain mercerized and unmercerized cotton. Various color combinations. For active or spectator sportswear. Retails for 35c.

5. Herringbone design in bright colors on subdued lisle-twist grounds. Pattern obtained by short floats on inside of hose.

6. "Duo-tone" diamonds of black, dark gray, and light gray obtained by reverse plating of colored lisles, plus a zig-zag wrapped border of red silk.

7. A fine check of white with a larger check of black, all on a henna ground. Vertical white lines obtained by reverse plating; vertical black lines, by fine wrap.

8. Grecian motif in white silk on a solid-blue silk ground relieved by self-verticals. Pattern obtained by wrap-knitting.

We are indebted to the following for the samples selected and shown here: 1 and 2, F. C. Zillman, Phoenix Hosiery Co.; 3 and 4, Richard J. Frost, Allen-A Co.; 5 and 6, J. V. Conlin, Holeproof Hosiery Co.; 7 and 8, H. W. Scruton, Interwoven Stocking Co.

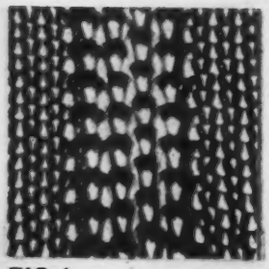


FIG. 1

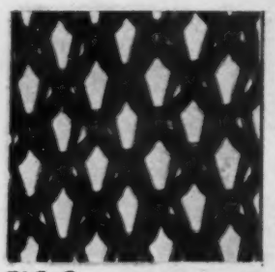


FIG. 2

FIG. 3

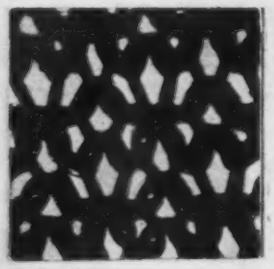


FIG. 4

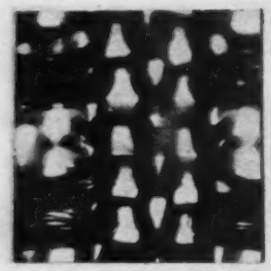


FIG. 5

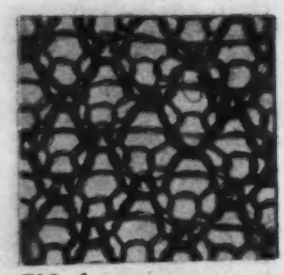
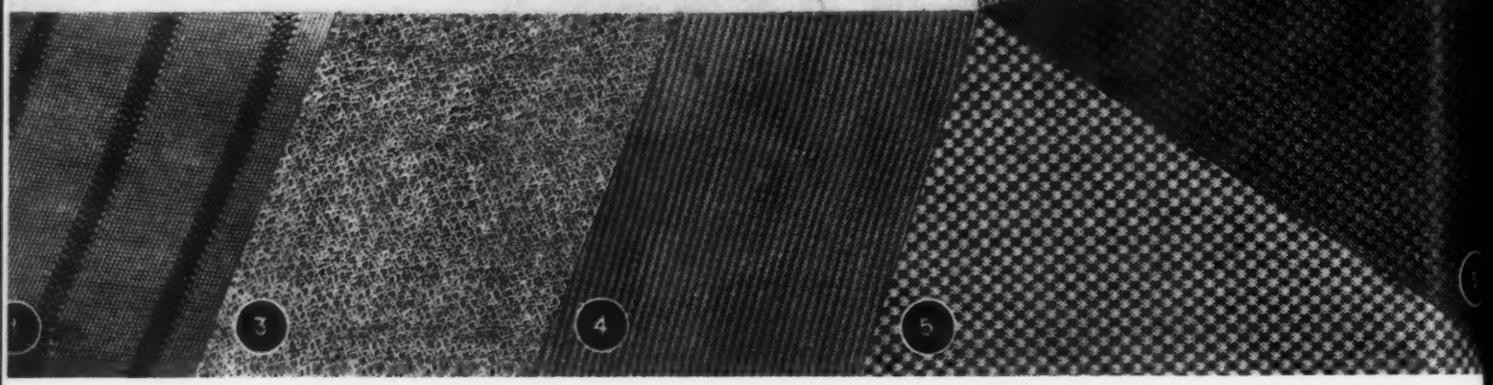


FIG. 6



Underwear Fabrics

On which knitters are relying to ward off encroachment

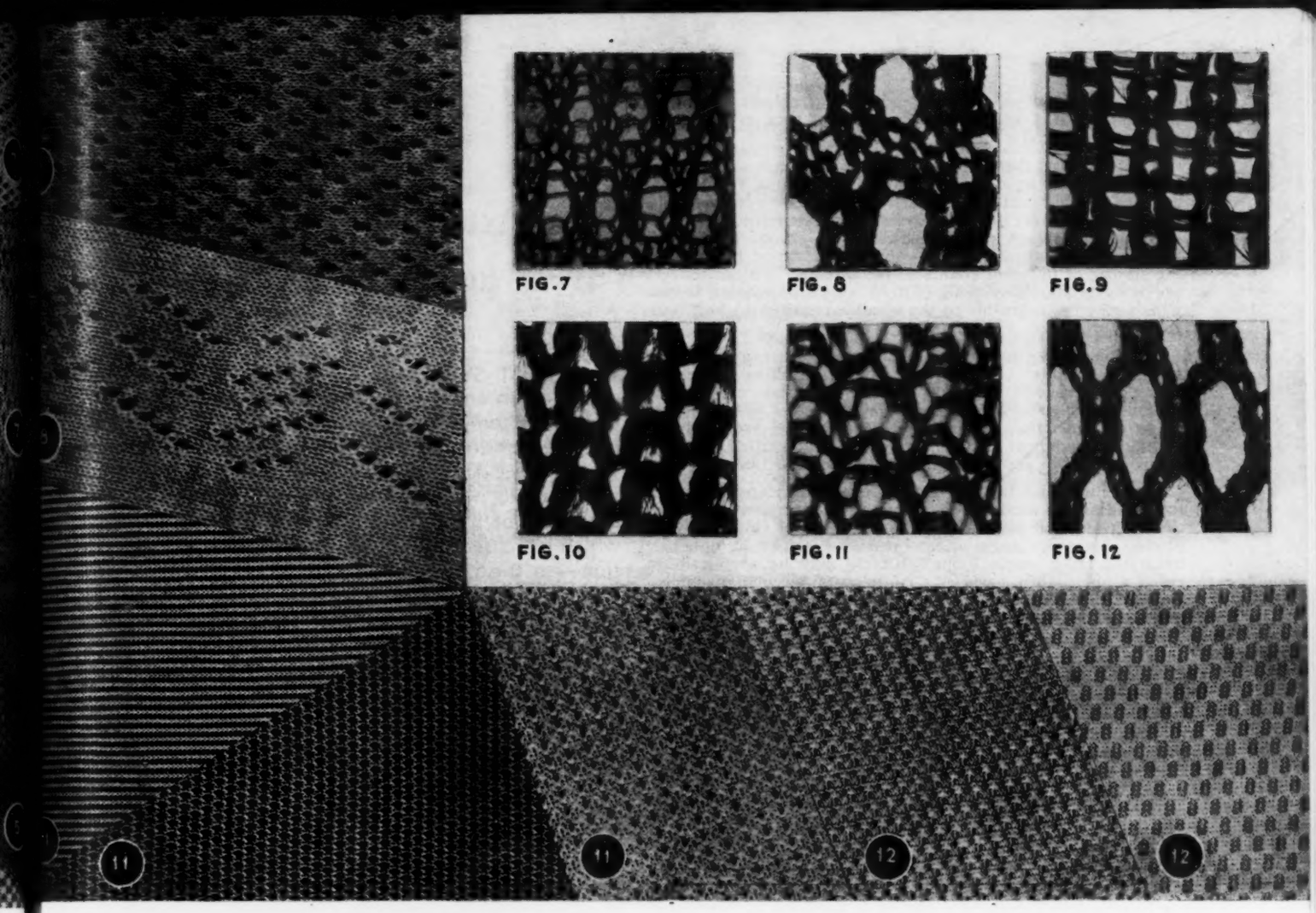
By John Chamberlain, F.T.I.
Leicester College of Technology
Leicester, England

ALTHOUGH signs indicate that weavers are making a bid to recapture the underwear market, especially with embroidered garments made from rayon satin and crepe, it is believed that the bulk of the trade will remain in the hands of the knitwear manufacturers. After all, while fashion dictates styles and fabric structures, there is a fundamental appreciation of many knit-fabric properties, such as sheerness, suppleness, porosity, and comfort.

Spinners have given the knit-goods manufacturers an impetus by producing many suitable types of yarn, such as fine counts of viscose, acetate, and cuprammonium; staple-fiber yarns; and mixtures of staple fiber with wool or cotton—while great improvements have been effected in the spinning of fine counts in single worsted yarns dyed in the cheese form and coned to run off without trouble on the fine-gage rib knitting machines. Color effects are obtained by cross-dyeing in the piece when viscose and acetate yarns are used; while the employment of lustrous and delustered yarns, dyed in one color after knitting, tends to widen the range of effects still further.

Broadly speaking, underwear garments of today fall into two groups, viz., (1) those cut from tubular or flat web and made up in various styles and (2) those produced on circular or flat knitting machines as more or less complete garments. As the former require a considerable amount of making-up, the latter are increasing in favor, because, by reason of a variation in stitch structure, the garment is automatically shaped to the contour of the body or limbs. Thus, underwear manufacturers are introducing simple seamless garments with welt or hem, 1x1 or 2x2 border, tuck-rib lace skirt, 1x1 waist, and lace top for women's vests. Panties, combinations, and other women's garments can be knitted on similar machines, the garments being made in string formation with pull courses between them to facilitate their separation without cutting. This class of garment is still very popular in cotton, rayon, spun silk, wool, and mixtures.

Developments in circular purl knitting machines are enabling this class of garment to be taken a stage further, as it is possible to change to 2x2 rib or other broad rib and back to 1x1 tuck or fancy rib or purl. Flat machines are being fitted with transfer instruments or needles, which also enable rib changes to be produced automatically, and by means of which a form of pelerine or sinker-loop mesh is made.



This tendency to produce the complete component on the same machine is certainly affecting the fashion, as snug-fitting garments are produced and open effects obtained which rival those made on the full-fashioning lace machines of the Cotton type at a fraction of the cost.

Prevailing Stitch Structures

The introduction of finer-gage knitting machines and finer counts of yarn now enables stitch structures to be used which in the past have been of little value. New structures are being introduced which may become popular because of their run-resisting propensities, the latter being obtained without loss of elasticity. These will be described later. Further, the use of lustrous yarns or semi-lustrous yarns has widened the scope for shadow effects. Today such structures as raised tuck effects, float-stitch, and float-plating (fishnet) may be produced on one type of circular machine, pattern wheels being fitted to each feed. Rib machines may be set to produce fine rib and tuck lace, and interlock machines may be set to produce longitudinal effects and tuck-stitch fabrics. Pelerine mesh may be knitted on both flat and circular machines, while warp stitches, such as tricot and milanese, are now being produced in colors by using different types of rayon in the warps and cross-dyeing the fabric. Lace effects are being produced on tricot machines by the arrangement of the warps and different methods of traversing.

The accompanying photomicrographs of current stitch structures suitable for summer underwear show that the open mesh, either wholly or in part, is still preferred.

Fig. 1 shows a simple 1x1 tuck structure in longitudinal lines on a plain ground and is known as "satin" stripe. It can be produced on spring- or latch-needle circular machines at considerable speed, and the stripes may be of any width according to the needle grouping. The effect is due to the long, held loops, which give play to the luminosity of the yarn more than the shorter, plain stitches. Usually a single tuck is made on the odd needles of the striped portions at one feed, a single tuck is made on the even needles at the next feed, and so on at alternate feeds, the remaining needles knitting at all feeds.

Fig. 2 is a familiar, typical all-over, cross-tuck mesh which, if used for the purpose of design, may serve either as the pattern or ground, for which purpose pattern wheels are usually employed. This stitch is of the four-feed type; viz., (1) knit odd, tuck even needles, (2) plain, (3) knit even, tuck odd needles, (4) plain. The greater the number of tucked loops, the wider the fabric becomes, so that through the use of a bluffing device, plain or jersey stitch can be knitted which will automatically reduce the effective width.

Fig. 3 illustrates a random tuck structure which produces a crepe effect from yarns possessing only a normal twist. The effect of the irregular fabric distortion is a reduction in the amount of luster, so that lustrous or semi-lustrous yarns are generally used in the knitting. The tuck loops must be arranged so that no definite cycle can be identified, as a patterning effect is not desired.

Fig. 4 is the well-known Rubenstein float-stitch structure in delustered rayon, which offers much more resistance to running than ordinary plain or jersey stitch. It is produced on a four-feed cycle; viz., (1) float over odd needles, (2) all knit, (3) float over even needles, (4) all knit [described in detail in TEXTILE WORLD, Dec. 13, 1930, page 34]. This type of fabric is known in England as circular lock-knit. A common variation is a three-feed cycle: (1) float over odd needles, (2) float over even needles, (3) all knit. The Rubenstein patent was purchased in 1930 by a group of rayon companies.

Fig. 5 illustrates the principle on which many designs are produced in float stitch, both in single colors and in white and color, the latter effect being usually obtained by dyeing the viscose components in the fabric form, leaving the acetate loops undyed. In the illustration floats are made over two

needles; and it is on this basis that fabrics such as twills and corduroy are produced.

Fig. 6 shows the loop structure of a simple 1x1 fishnet fabric produced by using two threads in plating relationship and floating the normal face yarn over the odd needles at the first feed and over the even needles at the third feed, both yarns being knitted on all needles at the second and fourth feeds. The openness of the mesh may be varied by employing similar or different counts of the threads. Pattern effects are being produced by using pattern wheels possessing inserts which give the extra lift to the needles required to knit both yarns.

Fig. 7 indicates how a still more open mesh can be knitted on this principle. In this case there are three successive floats over the odd needles, followed by a plain course, and a similar number of floats over the even needles, also followed by a plain course. In both cases the designs are produced by the arrangement of the float-plated and knitted sections, as shown in the accompanying fabric reproductions.

Fig. 8 illustrates the use of the sinker-loop transference on to the adjoining needles. In the photomicrograph, three successive elongated sinker loops are transferred collectively to produce clear openings. Less open effects may be obtained by transferring single loops. Effects may be produced on either a plain-fabric basis or a rib basis on circular machines, while on flat machines it is possible to produce 1x1 rib and all-over or selective mesh at will.

Fig. 9 shows the application of the coiled-loop fabric (Mills' patent) to the production of underwear. This is a well-known run-resist fabric and has been used extensively in the production of seamless hosiery [TEXTILE WORLD, November, 1934, page 88]. Large circular machines are now being built to produce fabric for underwear manufacture, and it is hoped that the use of the stitch for this purpose may be even more extensive than in the case of hosiery.

Fig. 10 illustrates the construction of a wale-lock fabric which is being produced under the Wildt patents. Machines up to 20 in. in diameter are being built. The basic feature, as may be seen from the photograph, is that the loops of a plain-knitted fabric are reinforced and completely locked by means of "wale" or warp threads, one to each needle, which are formed into longitudinal chains at the back of the fabric [better shown in November, 1934, TEXTILE WORLD, page 90]. As the warp chains are interlocked with the needle wales only, the elasticity of the fabric is unimpaired. Very fine threads are used for the warp or wale loops, and each thread is supplied from an individual source.

Fig. 11 indicates the loop structure of one of the many types of tuck interlock fabric. In this case the tucking is carried out on the dial needles so as to form a piqué stitch. Interlock fabrics in rayon are used extensively for underwear, as well as for sport shirts. In some cases effects are produced by omitting needles at intervals, or by tucking in certain sequences. Fabrics of different types of fancy interlock stitches are shown in the accompanying illustration.

Fig. 12 gives a simple illustration of a typical warp net which may be used in stripes or geometrical forms. It is produced by using two half sets of warps, lapping in opposite directions, which form pillars as shown. Through changing the position of the pillars, the hexagonal mesh is produced. If parts of the warp are drawn in full, these form a solid fabric at the positions assigned to them by the traversing mechanism.

Fine-gage rib fabrics are coming into favor again, owing to their excellent elasticity, while tuck lace garments are likely to continue in demand. Cotton, rayon, and fine wool yarns of the zephyr or botany type are used according to the customer's requirements.

To obtain an imitation of true lace, it is good practice to use fine yarns—say, single 40s worsted—for the tuck-rib lace and 2/40s for the 1x1 rib. Trick wheels or other selecting mechanisms are used for patterning purposes, the standard honeycomb mesh being three tuck, one plain.

Probably sufficient evidence has been offered to show that the knitwear industry does not intend to relinquish its hold on the underwear trade. Provision is made to suit all feminine requirements, while the mere males are gradually being cajoled into accepting more suitable stitch structures and more comfortable garments.

$49,000

By F. R. Fletcher
McKinsey, Wellington & Co.
Management Engineers

◆ A COST SYSTEM is not an end; it is merely a means to an end. And often the direct and indirect results accomplished far surpass anything even imagined at the time of installation of the system. In the case described in the accompanying article, for example, the discovery of certain discrepancies, by means of a cost system, led to a series of steps which increased the efficiency of the entire organization—to the ultimate tune of $49,000 a year savings . . . Readers who are interested in knowing more of the details of the cost method and the technique employed will find a description of it in a bulletin published by the National Association of Cost Accountants.

TO PROVIDE closer control over operations an eastern hosiery mill installed a modern standard cost system which, among other things, quickly showed that there were great variations from standards in the full-fashioned gray goods mending department even under normal production volume and conditions. A study of the department, inspired by the new cost figures, brought to light the following conditions:

Incoming hosiery was distributed among 30 operators, who were expected to examine each piece for defects and to mend them. Then a group of 20 inspectors was supposed to inspect each stocking to see that all defects had been properly mended and to return imperfectly mended ones to the menders. As a check upon these inspectors, samples of each lot went to a group of five final inspectors. But even with all this inspection, defects were often undiscovered or ignored. By the time the hosiery reached the finishing department the unmended defects were usually so badly aggravated that from 10 to 15 menders had to be employed there to rectify the faults of the gray goods mending and inspection.

The study showed a wide variation in the average number of defects for different styles of hosiery. Yet the production of the menders when working on hosiery with few defects was no greater than on styles which averaged a large number. This was traced to the method of wage payment—straight piece work based on an average number of defects per dozen pairs of all types regardless of variations due to styles. Since the incentive rewarded the mender solely for the number of stockings mended, a mender working on a batch of hosiery containing but few defects per dozen soldiered in order to "protect" the rates. To get production on a batch containing a large number of defects the mender would not exert herself to find all minor defects nor would she mend all of those she found. The defects which got by could seldom be satisfactorily mended after the finishing operation. The result was a production of seconds amounting to 40% of the total production.

It was obvious that to be most effective the wage incentive should reward the mender, not only for the number of stockings turned out, but for the number of

a Year

Saved by standard cost system in a hosiery mill

defects mended—a combination of quantity and quality incentive.

An analysis was made to determine the average number of defects per dozen pair of each style, and which preceding manufacturing operation was responsible. It was found that for the same style there were wide variations between the number of defects per dozen. For example, one sample dozen had a total of only seven defects, while another dozen of the same style showed 43 defects. The average for this style was 23.8 defects per dozen.

Time studies were now made of the mending operation, which broke down into the following elements:

1. Pick up and untie dozen.
2. Examine first stocking for defects.
3. Mend defects. (Repeat 2 and 3 for 23 stockings.)
4. Tie up dozen.
5. Sign name to tag and place dozen in container.

Obviously operations 1, 4, and 5 were the same regardless of the style of hosiery.

The time studies showed a wide variation in the relative time spent in searching for defects and in mending them—a condition which made any flat piece rate unfair and unsuccessful.

Since part of the trouble was obviously due to the nature of the defect—some being easy to mend and others difficult—further time studies were made to determine how long it took to mend each type of defect. There were, however, so many different types of defect that it would have been impracticable to set a seperate rate for each type. So the "average" defect, from the standpoint of the time needed for mending, was determined—which happened to be the ordinary dropped stitch which had run for five courses.

New piece rates for the menders were based upon a flat time allowance for operations 1, 4, and 5 plus the average time allowance for each defect mended. This rewarded the mender for both quantity and quality of output.

While the new rates per dozen pair were lower than before, they permitted as high earnings as the old rates. The menders agreed that they were fair.

Before the standards and piece rates could be put into operation it was necessary to have some means by which the actual total number of defects in each dozen could be determined and charged back to the operators responsible. This was done by means of a tag which was attached to each dozen pair of hose after the first manufacturing operation and which was not detached until the goods had passed through the finishing operation. The operator beginning each operation was required to sign the tag and the mender noted opposite each of these signatures the number of defects for which that operator was responsible. Inspectors then examined each stocking and noted opposite the mender's name the number of poor mends and neglected defects.

The information on the tags was tabulated to give the total number of defects per dozen chargeable to each operator in the manufacturing operations and the total number of defects mended by each mender. These tabulations made it possible to spot any mender who regularly failed to report the defects or who failed to find them. It was also possible to determine from these tabulations the ability of each inspector.

When the new method of wage payment was put in effect, the production of the department immediately fell to about half of normal. It was found that this was not due to dissatisfaction with the new method, but rather to the fact that, knowing that undetected defects would be charged against them, the menders were unduly cautious in searching for defects.

The obvious cure for this was to reduce the number of defects produced by the manufacturing operations. In each of the manufacturing operations wide variations between the average number of defects per dozen for individual employees were found.

Standards of quality were therefore set for each manufacturing operation based upon the actual previous performance of the more skilled and careful operators. On one operation, for example, which averaged eight defects per dozen, it was found that more than one-quarter of the employees had been able regularly to hold the defects down to an average of three per dozen. This was taken as the standard for that department. A bonus was offered for meeting the new quality standards. Before long the new standards were being met in all operations.

It naturally followed that when the menders began to receive hosiery with fewer defects they were able safely to relax their former excessive caution, with the result that production soon went to above normal.

At first some menders were unwilling to cause financial loss to manufacturing operators by charging defects against them. Failure to charge defects could be determined from the tabulations of the quality tags which showed the average number of faulty mends or neglected defects charged to the mender by the inspector. Since the average number of defects was now so low, it was assumed that failure to mend a defect was due to reluctance to penalize the operator who was responsible. When, however, the mender was herself penalized financially for failure to report, this trouble disappeared.

The inspection control which had been set up showed that there was considerable difference in the effectiveness of the various inspectors. By recording the deviation from long-time averages it was possible to keep the inspectors alert.

Further experience and experiment showed that it was not necessary to have each stocking inspected, but that it was sufficient to inspect sample lots taken from each mender at irregular intervals. This made it possible for five inspectors to do the work which had formerly required 25.

Within 20 weeks after the new methods were put into effect the average number of defects per dozen had dropped from 23.8 to 12.6.

The Net Result

The total saving of approximately $49,000 a year was made up as follows:

$10,000 a year saved in mending costs without reducing the individual operator's earnings.

$15,000 a year by eliminating 20 inspectors.

$4,000 a year by eliminating practically all finished mending.

$20,000 a year in the reduction of seconds from 40% to 18% of production.

The Tale of a Pail

That started a modernization program which has never ceased

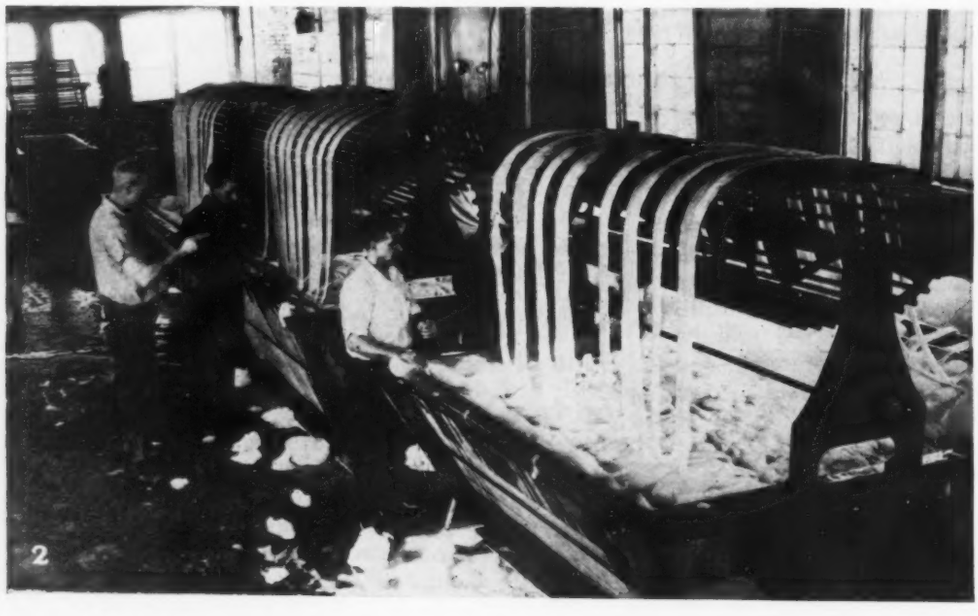
FIFTEEN YEARS AGO the superintendent of a small finishing plant in Johnstown, N. Y., bought a Monel metal pail for use in the dyehouse. With this modest purchase, he started a modernization program which has never ceased. The superintendent, Bertram Goldberg, soon became president of the company, which today bears his name, Bertram Goldberg, Inc. Formerly the work was mainly the bleaching, dyeing, and weighting of all silk, warp-knit goods. Today the plant handles a wide variety of tricot and milanese fabrics made from silk, rayon, acetate, cotton, and combinations thereof. Coincident with the changes in management and type of material processed, have been the improvements made in the plant equipment. The latest move has been the installation of the first of several Singer machines which will do away with the usual laborious method of tacking selvages by hand. Mr. Goldberg's ideas about modernization are summed up in his own words: "If we had not put the plant in shape when we could, we would not be in business today; if we do not keep on modernizing, we shall not be able to stay in business."

CHAPTER I—In 1925 the first real steps were taken toward modernization of the Bertram Goldberg plant. Dyehouse equipment consisted of a heterogeneous collection of wooden machines for boiling-out and bleaching and copper-lined machines for dyeing. Dyeing was carried out in a broken-soap bath, and it was always necessary to watch out for verdigris, and to clean the tanks thoroughly before changing from one shade to another; seams gave out frequently, holding up production; it was impossible to dye with developed colors. Revamping of the dyehouse started with the installation of the three reel dyeing machines shown in Fig. 2. These machines, which were built to specifications by Werner & Co., are fitted with Monel metal linings, heating units, and supporting frames, with reel rods of pure nickel tubing. Results obtained with these machines were so satisfactory that additional equipment of the same general type (but of the smaller size as in the background of Fig. 2) were installed from time to time, until by 1932 all of the original dyeing machines had been replaced.

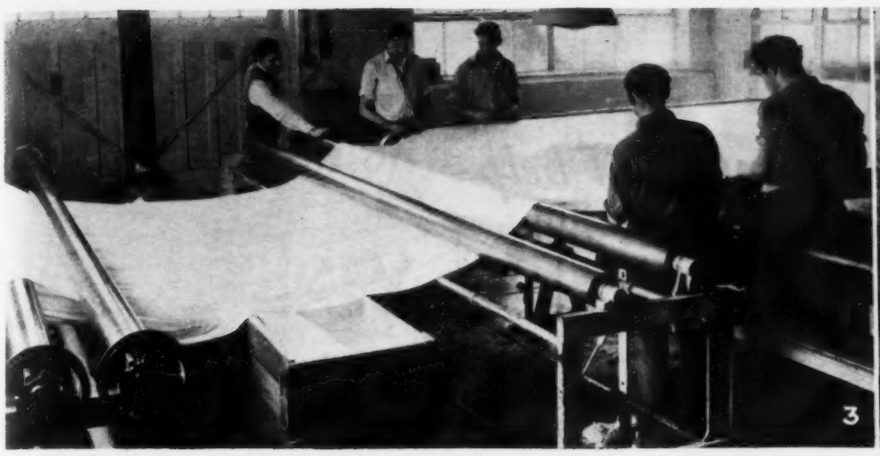
The extent to which standardization prevails is one of the most noteworthy features of the dyehouse. Machines are all of uniform construction and in two standard sizes; machine speeds are standardized; each machine is fitted with a Taylor indicating thermometer to insure standard temperatures; Monel metal has been adopted as the standard for dye pails, dippers, strainers, racks on which the fabrics are unloaded from the dye vats, hampers or trucks for conveying wet goods to the extractors, and boxes for holding the fabrics at full width after extracting and before framing.

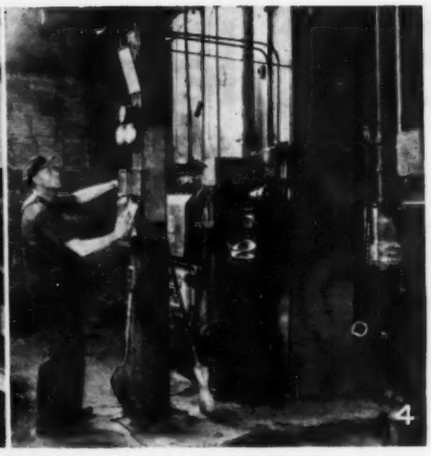
Benefits derived from the new dyehouse equipment are varied. Fabrics can be boiled out, bleached, and dyed in the same machine; direct, basic, developed, aluminum mordant, acetate, and logwood dyes are applied without trouble; redyes have been cut to a minimum; production has been speeded up; marked reductions in maintenance and labor costs have been effected; and working conditions have been improved.

CHAPTER II—Modernization was not confined to the dyehouse, and in the autumn of 1926 a new system of drying and tentering was installed. Original drying equipment consisted of four hand frames. These had a total capacity of 6,250 yd. per day and required 25 operatives. Present equipment (Fig. 3) has a capacity of 18,000 yd. per day and requires only six operatives. It consists of a Textile Finishing Machinery Co. pin tenter with a specially designed heating unit. Recently the delivery end has been fitted with selvage trimmers. Soon after the tenter was put in operation, Mr. Goldberg devised an ingenious type of machine to eliminate hand doubling and folding, two of which are now in use in the finishing department.



CHAPTER III—Modernization of power plant and auxil-





iary equipment has kept pace with that of productive machinery. In 1929 two 200-hp. extra-heavy Keeler boilers were installed for generating steam at 250-lb. pressure, and in 1931 two Cokal Pulverzone automatic stokers (Fig. 4) replaced hand firing and made it possible to switch to the lowest-priced nut and slack coal.

Other auxiliary equipment which has been installed includes a Patterson-Kelley heat exchanger for recovering heat from dyehouse wastes and a Permutit water-softening system for treating all process and boiler feedwater. An interesting innovation is a hot-water storage tank equipped with an inverted Fulton-Sylphon temperature regulator, which supplies warm water to the dyehouse at a uniform temperature of 130° F. by injecting cold water into the hot-water line as it comes from the storage tank.

TEXTILE WORLD'S Guide to Knitting Arts Exhibition

(Continued from page 96)

hose and women's panties and other garments, general utility machines for seaming knit fabrics; machines for hemming legs of men's shorts, for double-stitch felling in the tubular portions of athletic underwear made from woven fabrics, and for seaming men's shorts. Rep.: T. S. Whitsel, C. S. Thompson, A. S. Riviere, A. J. Feigel, A. E. Brauch, P. J. Steeper, T. M. Murphy, G. A. Rundle, E. E. Gratsch, W. E. LeRoy, Wm. Bleicher, W. J. Brauch, F. H. Gill, S. J. Storey.

United Elastic Corp., Easthampton, Mass. Booths 134, 135. Elastic for hosiery and underwear. Rep.: G. S. Van Voorhis, W. E. Dalby, H. O. Hollingworth, E. R. Boehm, R. A. Kendrick.

U. S. Ring Traveler Co., Providence, R. I. Booth 200. Ring travelers. Featuring patented Ne-Bow and Bevel edge travelers. Rep.: A. M. Bowen, Wm. P. Vaughan, M. L. Bolton, C. W. Smith.

U. S. Rubber Products, Inc., New York. Booth 85-88. Lastex topped self-supporting hosiery for men, women, children. Rep.: Wm. H. Barnhardt, Paul Linke, J. J. Fodor.

United States Testing Co., Hoboken, N. J. Booth 349. Testing and inspecting and consulting. Featuring new Evenometer for grading evenness of raw silk by photo-electric cell. Rep.: A. L. Brassell, S. B. Walker, P. R. Evans.

U. S. Textile Machine Co., Scranton, Pa. Booth 79AA. Winders, doubler twisters, high-speed redraw machine, Acme double-deck twister. Featuring oilless and ball-bearing equipped machines. Rep.: A. W. Thomas, P. J. Thomas, E. L. Townsend.

Universal Winding Co., Boston, Mass. Booths 123-128. Winding machinery. Featuring No. 50 machine for winding rayon cones with new belt drive using one belt for 12 spindles, No. 50 machine for winding silk on paper cones with new pineapple cone attachment, Roto-Koner for winding knitting yarns on paper cones. Rep.: R. A. Leeson, E. O. Smith, P. D. Howe, Robert Leeson, E. A. DeWolf.

Van Straaten & Havey, Inc., Philadelphia. Booth 20. Silk yarn. Rep.: Alex. Van Straaten, M. H. Smith, T. Y. Wilson, R. D. McDonald, C. E. Havey, Bert Berenson, J. F. Kester.

Victor Ring Traveler Co., Providence, R. I. Booth 375. Ring travelers. Rep.: B. H. Waterman, J. A. Hull, E. R. Jerome.

Viscose Co., New York. Booths 305, 306. Rayon yarns and fabrics. Rep.: W. D. Benson, T. H. Andrews, M. H. Morse.

S. Walter, Inc., Philadelphia. Booth 169. Paper specialties. Rep.: E. S. Rains.

Warwick Chemical Co., West Warwick, R. I. Booth 336. Textile chemicals. Featuring new products for processing knit goods. Rep.: D. S. Chamberlin.

Waterman Currier & Co., Inc., New York. Booth 137. Knitting yarns. Rep.: S. E. Fulton.

Fred S. Wetzell, New York. Booth 176. Natural and dyed cotton yarns. Rep.: F. S. Wetzell.

Whiting-Patterson Co., Inc., Philadelphia. Booth 175. Transparent cellulose envelopes for the hosiery and knitting trade. Rep.: W. P. Nickerson.

William Whitman Co., Inc., New York. Booth 151. French-spun worsted and merino yarns, spun rayon and cotton yarns. Rep.: W. A. Fuller, J. J. Devlin, M. H. Horchler, P. L. Lamb, K. N. Merrill, J. L. Stickney, W. G. Strugnell, J. E. Varney, R. J. Walsh, H. C. Leswing, H. S. Hicks, C. J. Welles.

Wildman Mfg. Co., Norristown, Pa. Booths 93-98. Circular and full-fashioned hosiery machinery in operation.

Willcox & Gibbs Sewing Machine Co., New York. Booths 289-292, 327, 328. Sewing machines. Featuring Fastlock machine for attaching elastic to tops of knee-length hosiery. Display of Metropolitan machines for first time under Willcox & Gibbs auspices. All machines in operation on double-sectional and individual power tabling. Rep.: G. M. Lewis, A. E. Selby.

Wolf Bros., Philadelphia, Booth 39B. Printed paper bags for packing hosiery, merchandise counter bags for advertising, transparent cellulose envelopes for packing. Rep.: Wm. P. Brockermann, Jr., W. L. Wolf, J. A. Hedges.

Jacques Wolf & Co., Passaic, N. J. Booth 353. Textile chemicals. Featuring chemicals for processing knit goods, including Loupole W-950, Hydrolite W-923, monopol oil, Oratol W-746. Newly developed boil-off oils and soaking compounds for direct knitting. Rep.: F. G. Henckel, C. R. Bruning, M. F. Costello, W. Deuble, J. F. McDonagh, C. J. Rahm, H. Sweetman, G. W. Searell, C. E. Wright, C. J. Desmond, Arnold Pfister.

Thos. Wolstenholme Sons & Co., Inc., Philadelphia. Booths 315, 316. Worsted and merino yarns. Rep.: L. F. Schaeffer, F. S. Krecker, G. C. Zimmerman, L. F. Schaeffer, Jr.

Robert A. Wright, Boston. Booth 176. Worsted, cotton, merino and rayon yarns. Rep.: Robt. A. Wright, F. S. Wetzell.

O. F. Zurn Co., Philadelphia. Booths 171, 172. Textile chemicals. Featuring new Esto wax softener, for softening and finishing all types of cotton knit goods; recently developed penetrant and vat assistant. Super Z wool oil for spinning mills, lubricating oils for knitting mills. Rep.: Robert Cowan, H. E. McNab, E. W. Snodgrass, Robt. Smith, M. J. Nolan, R. W. Zurn, H. F. Zurn, A. Dahlgren, C. J. Curran, O. F. Zurn, J. L. Wilson.

Seamless Progresses . . .

Recent improvements will help to support its production curve

The square heel on seamless hosiery

By Southwick Hall

IT WAS just twenty years ago that the seamless-hosiery machine which automatically turns and knits in the welt was introduced to a rather astonished knitting industry. In those days most women bought seamless hose as a matter of course—it was the staple stocking—and the manufacturing economies and improvements in the stocking which the new machine effected seemed to assure the continued dominance of this type of hose. The knitted welt assured a uniform length and an elasticity equivalent to that of any other part of the stocking.

But several advantages which full-fashioned hosiery then had—and in some important respects still has—over seamless were already becoming recognized by those consumers who were financially able to discriminate. The full-fashioned product was of finer gage, it had a right-angled foot which minimized wrinkling at the instep, it had a more accurately shaped toe, and it could fit snugly at the ankle and yet allow plenty of room at the thigh. Consequently, when the post-war boom of the twenties brought a lusty prosperity to the country, the production of full-fashioned hosiery advanced rapidly; and just about ten years ago (late in 1925, to be exact) the full-fashioned production curve crossed that of seamless.

Naturally, the challenge was answered by the seamless industry through the introduction of improvements in its product. Already, of course, machine attachments were producing seams and fashioning marks. Also the number of needles in the cylinder had been progressively stepped up. Just as the two production curves crossed, the 70-gage needle was brought into play. Thousands of machines employing this needle were installed in succeeding years. The number of needles per machine rose eventually to 340—with even 360 available, although not, so far as I know, in commercial operation.

In 1927 arrived the machine equipped for spiral or float knitting—intended originally for fishnet work, but soon found useful for new shapes of heels and soles and for clocks and fancy welts. The seamless industry was shortly producing picot edges and tapered heels—and, when a suitable extension was put on the eccentric cam which made the tapered heel, the cradle sole arrived. About this time also came the stitch-slackening device which permitted a reinforcing yarn to be thrown into the high heel and double sole while retaining a tight stitch in the ankle and instep.

During the period in which this multiplicity of new attachments was arriving and the 70-gage machines were getting off to a good start, another important evolution was taking place. Originally, of course, seamless hosiery was made without any changes in stitch tightness to shape or fashion the stocking. Just previous to the time now being considered, however, this fashioning was common practice; but the stitch changes were made in only five graduations and were visible to the naked eye. Now began, therefore, a series of increases in the number of teeth in the graduating wheel, until today, with well over 100 graduations, the changes are not detectable and the stocking has a fit previously unknown in seamless.

In spite of these improvements, however, the seamless curve was, in 1929, continuing to slip downward; and on Sept. 27 of that fateful year, the Spiral Knit Hosiery Guild was formed to establish standards and popularize fine-gage (300-needle or over) seamless. At this time the ratio of full-fashioned hosiery production to that of seamless was about four to one. The Guild was short-lived, but support for the production curve arrived from an unexpected quarter—the depression. And other technical improvements, beyond those already mentioned, were in the making.

The first of these, announced early in 1930, was a better toe. Seamless stockings had previously had too much fabric in the toe, and the new invention elongated the narrowing about 25%. To avoid visibility of the toe portion when the stocking was worn with low-cut shoes, the upper portion of the toe was knit of instep yarn and the heavy yarn for the end portion was made to reach back to the ball of the foot. Furthermore, the looping or seaming was placed underneath the toe. Part way along the narrowings and in between the narrowing and widening for the forming of the toe, a gusset was knitted in to improve the appearance of the stocking and eliminate the "dog-ears."

Next came experiments toward making a square heel which would place the foot at more of a right angle to the leg. The first of these to be publicly announced, in 1932, was produced by the insertion of some nineteen extra courses above the gore, which brought the gore line to a more vertical position. The purpose of the invention was not only to eliminate wrinkling at the instep, but to prevent the stockings pulling up or down. Later, in 1934, this heel was improved to extend the heavier fabric a greater distance toward the toe.

At about the same time that the first square heel was made available to the industry in general, the loose welt was introduced. This afforded increased elasticity at the thigh, and thus overcame one of the serious handicaps of seamless hose, although it sacrificed some of the fineness in the textural appearance of the welt. The loose courses increase the production of the machine and reduce the number of chain links required, due to the fact that fewer total courses are knitted in the welt.

Thus, it has come about that attractive seamless hosiery can be made today in fine gage and with a fit which, for many a normal leg, is as accurate as that of full-fashioned hosiery. The question yet to be answered is, will these improvements be enough to hold down and perhaps reduce the four-to-one production ratio now that the aid afforded by the depression is weakening? It is certain, at least, that they will help—that is, of course, if they are extensively adopted by the seamless mills and if the consumers are educated to appreciate their advantages.

Proper storage of greige goods and careful selection of nets effect

By William T. Leggis

Hosiery Dyeing Economies

IN THE manufacture of women's full-fashioned silk hosiery, every precaution is taken to prevent yarn defects and knitting irregularities. Then the greige stockings are given a rigid examination, which weeds out any faulty goods. Hosiery sent to the dyehouse is, then, the result of several weeks of careful fabrication and examination. The same care must be taken in subsequent operations to prevent damage and to insure satisfactory and economical processing. While a great deal has been written on the precautions necessary in dyeing and finishing, little has appeared on the gray storage of hosiery or on the selection of dye nets. In this article, therefore, the discussion will be confined to those two important phases of dyehouse operation.

It is imperative that all storage bins for greige goods be free from all rough places from which catches and pulls might result. The hosiery should be dry before being stored, and the storage room must be free from dampness, with all bins located away from heating devices and sunlight. Ample precautions should be taken against the breeding of mice and insects in the stored goods. Raw silks are ordinarily impregnated with various sulphonated and raw vegetable fats and oils during the throwing operation. These oils and fats are all susceptible to oxidation, some more than others, and intense warmth and light accelerate this reaction. This reaction results in the breaking down of the fats and oils and their becoming rancid, affecting ultimately the dyeing properties of the silk. When oxidation does occur, it is usually random and spotty and results in uneven dyeing. Proper storage conditions also prevent the growth of mildew spores, which also have a permanent effect on silk's dyeing properties.

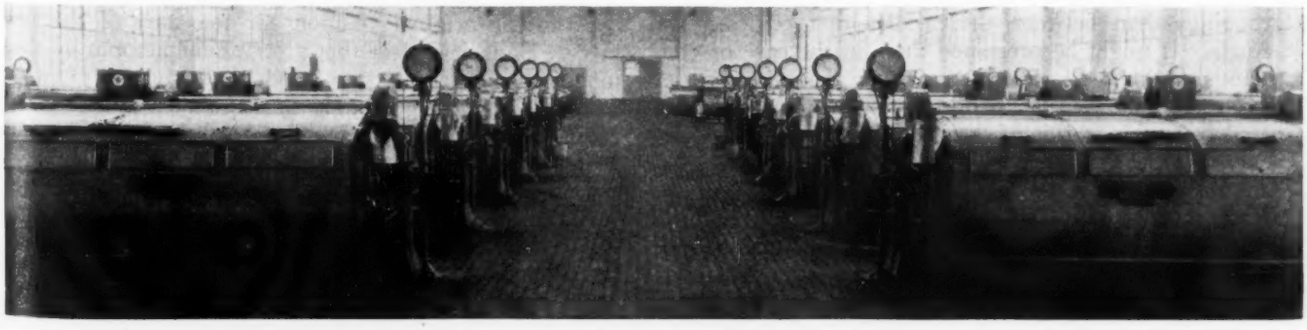
It is important, too, that storage precautions mentioned above be observed in the storing of legs previous to the footing operation. Sufficient oxidation of the legs will result in two-tone effects, a common defect in full-fashioned hosiery.

Proper selection of nets for the dyeing of hosiery is essential to best results and low costs. Dye nets consume considerable space in the dyebath and are a non-paying load. Hosiery is dyed in nets for the following reasons: (1) to facilitate handling and counting, (2) to minimize catches and pulls, and (3) to minimize tangling.

Various factors should be considered in the choice of nets. Dye nets go through rather harsh treatments day after day, and, therefore, must be ruggedly constructed to wear well. Processing liquors must be free to circulate throughout the net, which means that the texture of the mesh must be correct. The materials of which the nets are made must be such that lengthy processing will have the minimum of chafing effect on the silk. The size of the net should be considered both from the viewpoint of cost of the net and also from the viewpoint of tangling. Nets should be large enough for all the hosiery to have sufficient freedom of motion to allow penetration of processing liquors, but not so large that the hosiery has excess free space to move about. The greater the freedom of motion, the greater is the tendency for the stockings to tangle.

To illustrate how the proper selection of dye nets can effect real economy in the dyehouse, we can take the following example: Dye nets are usually approximately 20 in. wide and 30 in. long. They can be obtained in practically any weight, the common size of net weighing approximately 1 lb. Nets of finer mesh can be obtained having the same dimensions and weighing only ½ lb. Assume that a lot of 100 doz. pair of chiffon hosiery is to be dyed. It is the usual practice to process 5-doz. pair in each net. Chiffon stockings will average approximately ¾ lb. per dozen pairs. This means that 20 nets will be required for this lot, and if the heavier net is used, 20 lb. of the dye lot is due to the dye nets, a non-paying load. If the lighter nets are used, only 10 lb. of netting is used. The batch, therefore, can safely be brought to 110 doz., or an increase of 10% in production. The additional 10 doz. is processed with a negligible increase in cost.

Choice of dyeing nets of the proper size also offers possibility of economies. The usual net, as stated above, is approximately 30 in. long. This type of net offers too much space for chiffon hosiery to move about and tends to increase tangling. From 6 to 12 in. can safely be removed from the length of these nets for chiffon hosiery, with a resultant possibility of gain in pay load, or in an increased bath ratio, which tends to decrease possibility of chafing. For the very sheer, 1-thread and 2-thread hosiery, and also for 3-thread hosiery, it is desirable to use a bag of loosely woven cotton within the dye net. This additional protection will greatly decrease pulls, catches and tears during dyeing and subsequent handling. Finally it should be noted that thorough "shaking out" of the greige stockings previous to their being placed in the nets is necessary if uniform dyeing is to result.



Rib Cuffs and Bottoms

Produced on flat machines with racking

By William H. Brown
Straubenmuller Textile High School, New York

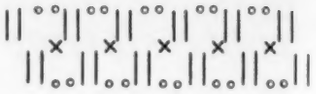


Fig. 1. Needle set-up for 2x2 rib.

Fig. 2. Space between groupings appears as missing needle.

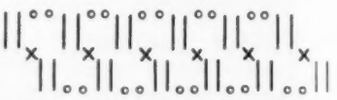


Fig. 3. Position of needles when racked at end of first course.

FOR rib work in the knitted-outerwear trade, the flat power machine possesses two important advantages. First, the amount of active needles may be increased or decreased, thus producing fabrics of various widths on the same machine. Second, the racking feature permits a firm edge or selvage to be produced at the exposed edges of the fabric. The racking feature may also be used in knitting certain fancy effects. The flat machine does however, have the important disadvantage of low production; and this fact has led to the machine being used for knitting small pieces of outerwear garments, such as cuffs and bottoms for sweaters, the larger portions of which are knitted on other machines having a higher production rating.

For cuffs and bottoms the most desirable fabric is the 2x2 rib, as this type of fabric is more elastic and retains its shape better than the ordinary or plain 1x1 rib.

In the needle set-up for 2x2 rib the needles must, of course, alternate in twos from bed to bed, or two in and two out, as shown in Fig. 1. When 2x2 set-up is made, however, the needles appear in groups of four (two in each bed), with a space equal to the cut or gage of the machine plus the thickness of one needle between each grouping. This is clearly shown in Fig. 1, which is a scale drawing of a 2x2 set-up on an 8-gage machine. The lines represent needles in work; the dots, needles out of work; and the crosses, the space between the groupings.

If the machine were operated with the needles in such a position, the ribs in the fabric would be grouped in like manner and the space between the groupings would appear as a missing needle (Fig. 2). Such a fabric, of course, is not so desirable as one in which the ribs are spaced uniformly across the fabric. The latter can easily be obtained by racking one position to the right at the end of one course of knitting, and one position to the left at the end of the second course (or vice versa), repeating this procedure throughout each cuff or bottom.

The position of the needles when racked at the end of the first course is shown in Fig. 3. Fig. 1 shows the position of the needles when racked at the end of the second course. Thus, it is clear that the abnormal space between the needle groupings appears once at the right and once at the left of each grouping.

The missing-needle effect obtained when the knitting is done without racking is due to the fact that there is a greater amount of unknitted yarn between the needle groupings than between the needles that compose the groups. It might be presumed then, in the case of continuous racking as described above, that the greater amount of unknitted yarn still exists, but is merely alternated from side to side of the groupings by racking. An analysis of the fabric shows that this is not the case. The question might be then asked, what becomes of the greater amount of unknitted yarn between the groupings? The answer is that the extra lengths of yarn of one course are robbed or drawn in partly by the formation of the next course and partly by the pulling effect caused by shifting the needles to the opposite position.

With respect to the chains (all references here are to the American chain system) flat power machines may be divided into four classes as follows:

1. A recently improved type that employs a short-chain system consisting of a set of main chains which control all automatic movements of the machine, including racking; an auxiliary racking chain for special racking; and a counting chain or device that operates when the main chain is idle.
2. An earlier type employing a short-chain system that consists of a set of main chains that control all automatic movements and an auxiliary set for special racking and striping. The secondary set is in operation when the main set is idle, and idles when the main set is in operation.
3. A short-chain system employing a main and secondary set of chains and a separate counting chain that automatically starts and stops either the main or secondary chains.
4. The old or long chains that operate continuously.

The chain movements required to produce a solid-color cuff or bottom are as follows: First are the yarn change to cotton separation and the setting of the locks for one round of tubular knitting to produce the separation. The yarn change and lock setting are accomplished in one movement of the chains and are controlled by the striper chain and the lock chains. When the round for the cotton separation is completed, the same two chains cause the cotton to be replaced by the yarn from which the piece is to be knitted and the locks to be changed from tubular knitting to plain rib, of which one course is knitted and is called the starting course. These changes are likewise accomplished in one movement of the chains.

The racked edge or selvage is then produced; and this usually consists of racking in the same direction, once at the end of each of the two courses following the starting course. This is controlled from the racking chain and requires two movements.

Up to this point the main chains only are in operation, the auxiliary chains remaining idle. The only action required from this point, other than plain knitting, is the racking required to obtain an equal grouping of the ribs described previously and merely requires the use of the auxiliary racking chains, which are then brought into action. The main chains idle until the piece is completed.

At the end of the piece the main chains are again brought into action (auxiliary chains idling). Two racking movements in the opposite direction to those of the racked edge or selvage are required to bring the needles back to the original position for the start of the next piece. Thus, it is clear that a very small amount of chain movement is required to produce this class of work. Likewise, a correspondingly small number of links in the chains are required—with the exception of the old chain system, and in this case the chains, other than the racking chain, consist mostly of neutral links to produce the required length for the cuff or bottom.

Since the pieces are only 4 or 5 in. long, the length of the chains does not prohibit the use of the old type long-chain system.

Indispensable to the throwster

By I. G. Sanford

FUGITIVE TINTS

Now aid the knitter and weaver

FUGITIVE tints play such a useful part in the manufacture of textiles that their value cannot easily be over-rated. They identify at a glance yarns, or even fabrics, which otherwise might require an extensive analysis. Throwsters have long employed fugitive colors to great advantage in marking their yarn temporarily for quick identification. Now an ever-increasing number of uses are being found for them. Tints are found to be quite valuable in coloring warps and in spotting filling yarns. Knitters have found that cones or other packages dipped into or striped with tint, if not already completely colored, are easy to distinguish. And staple spinners also can often use a fugitive to advantage in keeping particular yarns or lots separate.

Fancy crepe (loom state) showing position of high twist yarn by identifying tint
Filling bobbins used, showing tints which made correct selection easy

Each of the different methods of application requires tints with particular characteristics. For example, the rayon throwster who employs a standing bath to soak his yarn will want tints that are slow to exhaust; he would like to have colors that would be taken up in the same ratio as the other components of the bath, although such tints are as scarce as the proverbial hen's tooth. Practically always the tint exhausts more quickly than the other soaking ingredients; therefore, when the bath is re-used, more tint must be added to bring the color back to its initial shade. This is difficult, and it often happens that the color of the bath gradually grows stronger or weaker, but not to a sufficient degree to be detected until after the yarn has been removed and compared with preceding soakings. Once the soaker has determined the correct addition to keep the color uniform it should be recorded for future use. These records will save considerable time and trouble.

Tints made by mixing colors are particularly dangerous for use in standing baths, because they may not exhaust out of the bath in the same ratio that was used in mixing them. For example, a mixed green made of yellow and blue will change shade in re-used baths if the blue exhausts more quickly than the yellow. Satisfactory rebuilds when using such tints are almost impossible. Experience will show which mixed-color tints will maintain a uniform shade.

Standardization Desirable

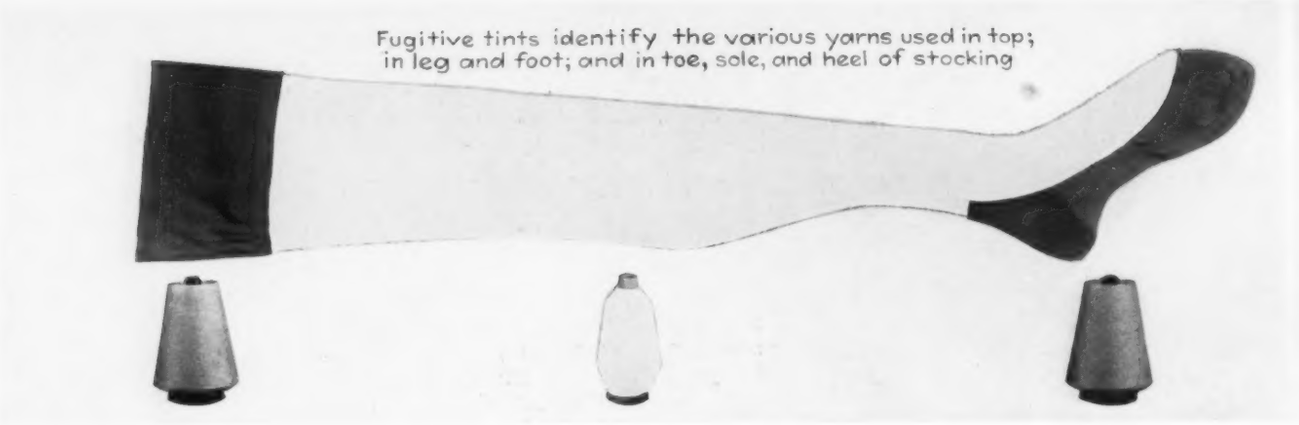
At present, universal standardization of fugitive colors seems impossible, because of the various fields in which they are used and the general looseness in naming and classifying colors. But this does not condone lack of system in a particular mill or chain of mills under the same management. It might soon be feasible for all plants doing similar work to develop and adopt fugitive color schemes; but at present the lack of system in many individual plants necessitates preliminary missionary work at home before going into broader fields.

In silk throwing a coloring system based on the number of threads has been found to be advantageous. (In rayon throwing the system can be based on the denier of the yarn and in spinning on the yarn count.) This is done merely by reserving a particular group of colors for certain yarns; for example, pinks for 4-thread 13/15, yellows for 6-thread 13/15, blues for 4-thread 20/22, etc. Every one who handles the yarn will soon become familiar with the system, and danger of getting the wrong yarn will be obviated.

There should be no great likelihood of confusing low-twist threads, such as hosiery yarn, with crepes or voiles; but the general practice has been to tint low-twist yarn with lighter shades than crepe. This is a good system to follow, as will become even more apparent later. This does not mean, however, that it is good policy to use dark colors for tinting. The lighter the tint, the better it is for at least six reasons: (1) Dirt can best be detected if tints are kept light. (2) Light-colored yarn is easier for operators to see, and so they can work more efficiently. (3) Heavy coloring has been known to weaken threads. (4) Dark tints are more expensive to employ. (5) As a rule, light tints boil out easier. (6) There is less likelihood of variations in shades with lighter colors. Of course, use of only light shades limits the number of colors available and there is greater possibility that light hues will fade out quicker than dark. But these drawbacks can be overcome by careful selection of tints.

When more than one tinted thread is used in a fabric, such as in crepe cloths or socks to be cross-dyed, it is generally good policy to use contrasting fugitives. To do so will be of great assistance in determining whether or not there have been any mistakes in the weaving or knitting. In such cases, too, a definite system should be employed, especially so in the case of crepe yarns.

There is practically no chance of one-way filling getting by in a crepe cloth if the two threads used have decidedly contrasting colors. In such yarn, not only



should the colors contrast, but also it is advantageous to have a light shade of a light color matched with a darker shade of a naturally darker color. For example, the following combinations could be used on rayon yarns: 75-denier, pinks and greens; 100-denier, yellows and blues; 150-denier, light greens and reds; 200-denier, light blues and off-shade reds. Under each of the general colors named there are several variations, so that it is possible to have more than one lot in the same class without fear of confusion. For instance, a lot of 75/30 could be colored flesh and olive, 75/45 could be tea rose and neptune green, and 75/50 might be orchid and grass green. In the case of crepes it has often been the practice for the light color to represent the "S" twisted yarn and the darker color, the "Z."

Importance of Color

When using tints, one is wise to take full advantage of the psychology of color. Some colors are infinitely more pleasant and easier to work with than others. For example, yellows have proved themselves far superior to murky browns. One silk throwster who had a bad-running lot of yarn changed his color from terra-cotta to canary, and at once it became one of the best lots in the plant. Colors that appeal to the eye should be preferred.

Once a lot has been given a certain color, extreme care should be taken to keep it uniform. Carelessness in coloring will quickly lead operators to disregard slight variations, and the result will be mixed lots if two somewhat similar colors are in use at the same time or if colors are so uneven as to cause two lots to overlap. Operators impressed with the importance of fugitives will be quick to discriminate between shades, and the running of a great many colors without danger of mixing yarns becomes possible.

It should be remembered that whenever yarn is twisted, it becomes duller and often changes shade. For that reason, it is wise to have samples of a color on both hard-twisted and slack-twisted yarns. Colors may seem different on untwisted bright rayon and delustered rayon; but once the yarns are twisted, the shade will be practically the same on both.

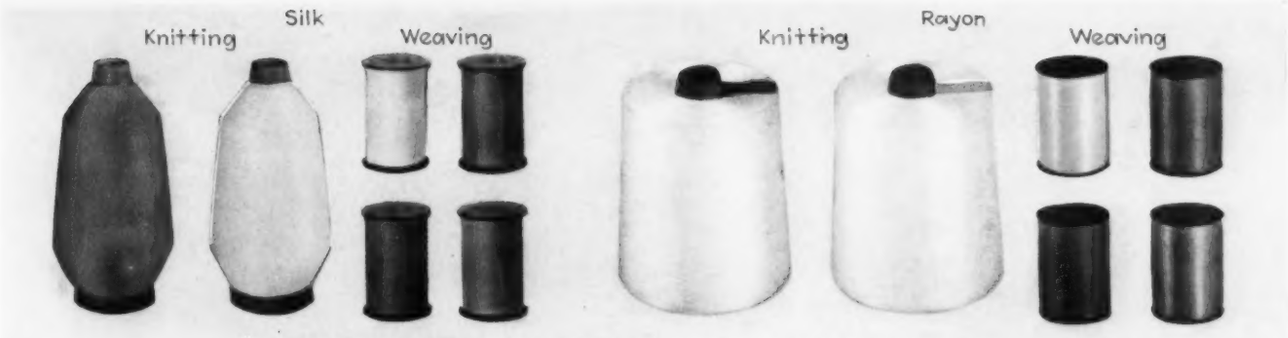
When several somewhat similar warps are being run at the same time, there is a minimum of danger of their being confused if each is given an identifying fugitive color. Tinting is particularly helpful when running two-beam jobs containing different yarns. Tie-threads should never become mixed if they too are tinted to match the warps for which they are intended. Here, as whenever tints are used, some system of coloring is most useful. Warps of a certain class should have one range of colors reserved for them; warps of another class should have a different range.

Warp tints also should be very light, so that they will not cover up dirt or make the pattern more difficult to discern. Dark warp tints can cover up light sets, heavy marks, wavy cloth, and wrong filling. But when the goods are finished, the manufacturer will wonder how such defects ever got by the grading room.

The cost of tinting warps can be kept to a few cents per beam. Application of the tint is easy, since it can be applied directly with the sizing solution. The tint should be boiled thoroughly in water and strained into the size kettle or size box. Only tints exhausting properly and fugitive from all yarns to go into the cloth should be used.

Weavers and knitters find fugitive tints invaluable in spotting untinted yarns which otherwise would be difficult to distinguish or keep separate. Spotting is done merely by touching the yarn with a brush that has been dipped into a suitable color. Here, as everywhere, the tints should be kept light and there should be some definite system.

Cones should be marked next to the core or completely across the top, so that no matter if only a little yarn remains, the tell-tale color will still be there. Filling bobbins should be marked near the base for the same reason. However, it is generally unwise to apply the tint to the bunch on the filling bobbin, as the water will



Silk and rayon knitters and weavers find that use of tints prevents confusion and mistakes

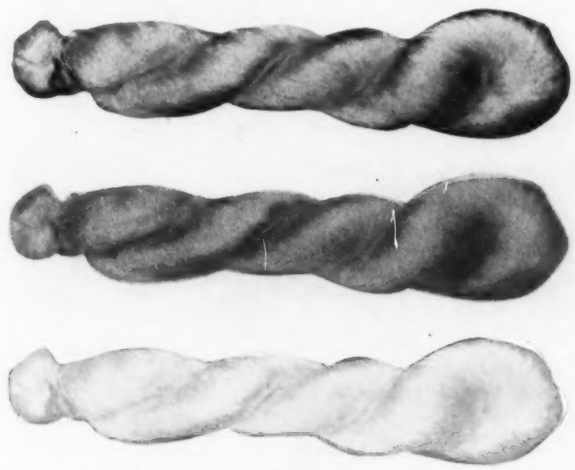
have a tendency to loosen it and cause trouble. Of course, the solution should never be sopped on, but should be applied lightly and with as little moisture as possible.

The price of tints ranges from a relatively few cents to several dollars per pound, which shows the necessity of knowing the properties and most economical methods of application of tints. It is entirely true that frequently low-priced tints are more expensive to use than higher-priced ones. This is because it is sometimes necessary to use considerably more of one tint than another to get an identical degree of color. For example, if it takes 6 oz. of a tint costing 60c. per pound to obtain the same color given by 2 oz. of a $1.25 tint, it is cheaper by almost 7c. to use the one costing more per pound. Over a period of time this saving would be considerable. Then, too, it is most likely that the higher-priced product is superior in other ways. Therefore, in finding the actual cost of a tint, one must consider both the price and the quantity necessary for a desired color.

A number of companies recommend the use of their tints in the proportion of 2 oz. to 100 gal., and it is good policy to follow their recommendations. For each tint there is a certain optimum amount, the volume of water remaining constant, above or below which it is poor policy to go. This amount generally follows closely the amount suggested by the manufacturing company.

It may be found that use of more than a certain amount of tint for a given volume will not be accompanied by a proportionate increase in color. When this situation is encountered, a tint made for a darker color should be used instead. To illustrate, it is wasteful to use 4 oz. of light blue tint costing, say $1 a pound, to obtain a medium blue shade that could be obtained by using 2 oz. of a medium blue tint costing about $1.25 a pound. In addition, a more even and wholly satisfactory coloring is obtained by using a tint in the same range for which it was intended. It is poor policy also to try to obtain a light shade by using a meager amount of a tint intended for a darker color. Uneven tinting practically always results from this practice, and a great many times the color cannot be maintained uniformly from batch to batch.

Anyone who is using tints in a standing bath, such as is common in soaking rayon, has an additional factor to consider in computing the cost of a tint. He must take into consideration the amount of tint necessary to bring the color back up after each use of the bath. Naturally a slow-exhausting tint, of which only a little is necessary for the rebuild, is more economical if the cost of the initial bath is in line.



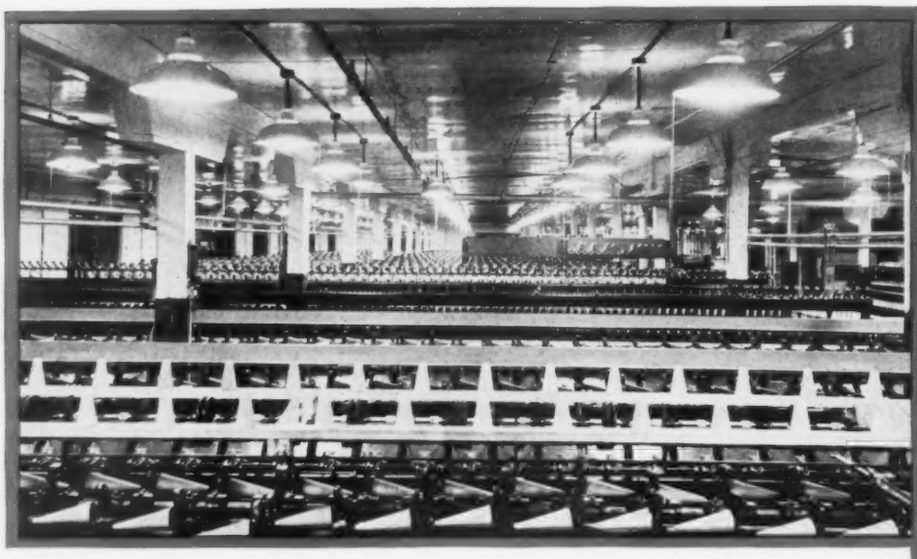
Fugitive colors may be used to show at a glance the type and size of yarn in skeins

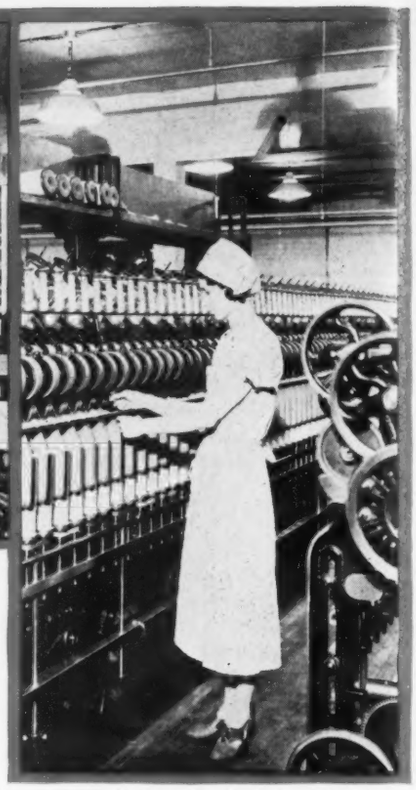
Records Are Valuable

Whatever the identification color used and however it is used, complete records should be kept. This will not only assist in identifying any tinted yarn at any time, but also will show just how the tint was used. In this way, subsequent lots of similar yarns can be marked the same way as the earlier lots, thus avoiding the confusion brought about by a great many different lots of yarn tinted with various colors. Once a particularly well-adapted fugitive is found, it should be specially noted for later use. A system of recording costs is also advisable, even though the cost of tinting should always be small.

In using tints, one should always remember that good coloring is not wholly dependent upon the tint itself but also upon the following factors: (1) the amount of the tint used, (2) the amount of yarn colored in a given volume of solution, (3) the amount of yarn per package and the degree of looseness, (4) the fineness or type of yarn, and (5) the amount of agitation.

Tint manufacturers are constantly striving to keep their products uniform and to make improvements wherever possible. Some have special lines for definite fields, and it is always safest to buy according to the manufacturer's suggestion, although tests should never be dispensed with, for it is the user of the tint who is held accountable for the success or failure of the fugitives he employs.





IMPROVED LIGHTING

Speeds-up colored-yarn production at P. McGraw Wool Co.

Fig. 1. (left) With the new installation, the light is well diffused and is uniform over the whole working area. Fig. 2. (above) Close-up of one of the spinning frames, showing absence of shadows. Frames are in double rows, back to back, and are located between rows of lamps.

ADDITION of some new winding machines to supplement the already extensive installation of spinning frames and the start of production of colored yarns necessitated the complete modernization of the fifth-floor lighting at the Pittsburgh, Pa., plant of the P. McGraw Wool Co., manufacturer of worsted knitting yarns. The existing lighting installation, consisting of 78 units using 150-watt lamps, was unsatisfactory for several reasons. To begin with, the fixture in use was an improvised combination of reflector and white glass diffuser which, while eliminating glare, gave insufficient light output. In the next place, the spacing of the lighting units was such that illumination on the machines was far from uniform. In fact, it was difficult, if not impossible, for the operators to keep from casting shadows on their work. Finally, low voltage at the lamps, the result of undersized and overloaded wiring circuits, further reduced the available light by as much as 25%.

The inadequacy of such lighting and the difficulties it created became more obvious and more serious when production on the colored yarns was started, because of the low contrast obtainable between the colors and the dark background of the machines. The problem to be solved, then, was to increase lighting intensity sufficiently to handle the colored yarns, to distribute the lighting uniformly over the length of the frames (some of them 40 ft. long), and to provide full voltage at all lighting outlets throughout the 180-ft. length of the working floor.

The reason for the pronounced voltage drop in the top-floor lighting circuits was easily traced to the wholly inadequate size of wire (No. 4) used in the main feeders. Electrical service in the plant is three-wire, 115/230 volts; but instead of getting 115 volts at the lamps, voltmeter tests showed drops of 10 to 15 volts. A 115-volt lamp operating on 105 volts will deliver only 85% of its normal light output. On 100 volts this drops still further to 75%.

The first step, therefore, in the new installation was the running of a new and larger main feeder to the fifth floor directly from the main transformer bank. Three 3/0 wires in 2-in. conduit were substituted for the No. 4 lines previously used. They rise into a centrally-located subpanel on the fifth floor. From this subpanel, with its 200-amp. mains, there go two 100-amp. branches, fused at 75 amp., to circuit panels or distribution centers, located in the approximate center of their respective halves of the floor. These sub-feeders from main to distribution centers use three No. 1 wires in 1½-in. conduit. The two distribution panels are of the dead-front, safety type, with tumbler switches which control six lights to a circuit. Each panel has provision for twenty 30-amp. circuits, fused at 15 amp., and uses No. 12 wire in conduit to the lighting outlets.

With adequate wiring installed, the next step was the selection and location of new fixtures. To insure a more uniform distribution of light over the winding and spinning machines, the number of outlets was increased from the original 78 to 162. The old reflectors were replaced with new 18-in. diameter Westinghouse Glasteel opalglass diffusing units, and 200-watt lamps were substituted for the 150-watt size which had been used.

Spotted on 8-ft. centers (with the exception of a few located over the winding machines), these fixtures were placed 9 ft. above the floor level. They give between 15 and 20 foot-candles uniformly over the full length of the machines at the operators' working level. As can be seen from Fig. 1, double rows of machines, placed back to back, are located between rows of lights.

ADVERTISING PAGES REMOVED

THE OVERSEERS' CORNER

Nobody is Perfect

By John Williams—Based on actual mill notes

WHEN I have been writing some of these notes in my diary, I have been conscious of the fact that I sound like a little-tin-god-on-wheels at times, and that I expect every overseer to be a paragon of virtue. This is very far from the fact. There is no need for me to spread my faults out here in print; but you may be sure that I have them.

All this merely brings me around to the point of how I handle my overseers. From some of the letters that have come in since I started running my notes in TEXTILE WORLD you would think that I was either hard-boiled, crazy, or a softy. The questions answer themselves. The difficulty is that I have set forth my inmost views, and described matters which were in process of being thought out and therefore subject to change to meet the immediate conditions to which I sought to apply them. As far as my degree of success in handling overseers in my own mill is concerned, I must leave that to the judgment of somebody else, but I must say that I have tried to be reasonable.

As I read the last sentence of the last notes, I must admit that it sounds nice, but doesn't mean anything. To be a little more concrete, I do not expect a $25 overseer to do a marvelous job; I do expect a man who is paid $50 per week to do something better. In other words no one is perfect, and, since this is an industrial civilization, to be reasonable you must judge them by what you pay them.

A Swiss View on Mill Discipline

Editor, Overseers' Corner:

Because I think that it is a very important matter, I am referring to your article "Overseer's Attitude Toward Workers." I have not seen any contributions from this country, and I guess you will be interested to hear what we think about these things.

Over here, each overseer is responsible for his department. If a worker has done a rotten job, the overseer has to warn him and show him once how to do the work properly. If the worker fails a second time, he is fined by the overseer, who makes a suitable note on his working-hour control. Next pay day, the fine is deducted from the worker's payroll. The fine is not used by the company, but is transferred to the workers' health insurance fund, or some other welfare institution.

In my opinion, this system has several advantages. First of all, the overseer doesn't have to do any swearing; he simply tells the worker why he was fined, and makes the note. The worker knows that he pays the fine to a fund for the benefit of sick operatives, so usually he submits himself to his fate without discussion. Another advantage is that the superintendent, looking over the working-hour control, gets acquainted with these birds who have been fined.

N. E. C.
Switzerland.

Quality-Control Department

Editor, Overseers' Corner:

I believe R.S.J.'s (December issue) idea for a quality-control department is not very practical. He says that this department would be responsible for defects in the cloth after the warp is started up. To shoulder this responsibility, this new department would have to have some authority with "teeth" in it over the weavers, otherwise they could not hope to keep weaving defects out of the cloth. What a politician the head of this department would have to be to keep peace between himself and the overseers!

He also says that the right man in charge of this department would enable the mill to almost completely eliminate seconds. Most any practical man can see the fallacy of this Utopian dream. True, he may help eliminate some seconds, but my experience leads me to believe that even *almost* completely eliminating seconds is not practically possible.

I suggest that the Superintendent institute a quality-control department with himself as the head, and with the overseers and their assistants as technicians in their respective departments. And at no extra cost too! J.C.C.

Orders Should Be Carried Out

Editor, Overseers' Corner:

In my humble opinion, the superintendent's remarks in the January issue struck one of the most vital sparks that affects the relationship between the manager and the employees; there is no one thing perhaps that creates more trouble or causes more dissatisfaction than to have the manager fail to follow his instructions through, and see that they are carried out.

Some subordinates like to impress the employees with the fact that they are the whole show, and that nobody else has anything to do with what they do or say; others through carelessness or misunderstanding fail to carry out orders, and naturally the workers feel that they are being gypped.

I believe it would be a good idea if every manager would post on bulletin boards throughout the mill a notice to the effect that he will be glad to discuss any complaint with the employees who cannot settle satisfactorily with their overseer. I have in mind one manager, whom we will call Mr. B, of whom the employees often say "if Mr. B knows all the details you are sure of a square deal," but here is where the rub comes in—too often these details are concealed from Mr. B. A more harmonious relationship should be established between manager and employees.

R. W. C.

Misuse of That Urge to Be Liked

Editor, Overseers' Corner:

It is the unfortunate lot of the writer to be associated with an overseer to whom the remarks of the super in the February issue apply in all particulars. This man is a hale-fellow-well-met; but lazy. He wants to be liked by his help, and believes that the way to that end is to be easy and not enforce discipline. As a result, his department is run in a somewhat slip-shod manner, and mostly by the help themselves. They are slackers on the job and only work at normal

CONTRIBUTIONS

Contributions to "The Overseers' Corner" will be paid for without regard to length. We will be glad to use letters discussing the narrative on page 117 or any other pertinent matter whether of mechanical, managerial or just plain human interest. Those who contribute kinks or practical helps will be paid additional for an appropriate sketch to illustrate their device. It is not necessary to submit finished drawings. If these pages interest you—contribute something to them to interest others. Address Editor, Overseers' Corner, Textile World, 330 West 42d St., New York, N. Y.

speed upon the approach of another authority.

The custom in this plant is to send men home when there is no work, unless they can be used to advantage in some other department. Recently, this overseer ran low on work and asked me to use two of his men. I offered these men a rush job, but one on which the rate was lower than that to which they were accustomed. They refused, and told their overseer to give them something else. He gave them the job of cleaning up the room at their higher rate. Was this in keeping with the best interests of the company?

Of course an overseer of this type, acceding to the help's demands, as to job preference, hours, and rates, has very little trouble with them. Once in a while he does make a great ado about nothing to hold face with his superior, who is not as conversant with the work as he should be, and everybody is happy. However, such an attitude does not endear him to the workers. Most of them look down on him, but they do appreciate their soft snap. Yet his lack of leadership makes it hard for the rest of us to maintain discipline, when our workers keep pointing to such favoritism. Possibly we are just as bad as he is or we would bring this condition to the attention of the management.

E. Z.

Must Gain Both Respect and Command

Editor, Overseers' Corner:

Building and keeping good relationships is the sincere endeavor of the overseer. He does not relish the changing of employees, for each new one gives him added responsibilities, both in personality and ability. The overseer knows satisfied workers make willing workers, adding to the efficiency of his department. He studies each one as an individual and not as a collective group of people. Lending an ear to the understanding of their troubles both as to the shop and home life, patiently helping to iron out their troubles and faults, and using a firm hand of check when necessary places the overseer in the life of his workers, as one with respect and command.

Then again he must stand apart from his employer and employee. The meetings of both are closed doors to him. Still, in case of trouble, both superintendent and employees like to have a birds'-eye view of each other from the overseer. Why a firm should expect the overseer to help play the part of a mediator is beyond the writer's conception. It is quite natural for the employees to try and keep their plans from the overseer, knowing his side should be that of the firm. Yet from individual employees he learns their grievances, and from the firm very little or nothing.

It seems hardly possible that a firm giving a 10% reduction and then giving a 10% increase, failed to realize that it does not restore pay to the former level. One can understand a superintendent doing some of the hiring—he still likes that privilege only too well—but how he can, without thinking, put a man to work at a higher rate of pay is beyond human understanding. Mr. Williams, in the January issue, is either trying to get a rise out of the overseers or else he is a dyed-in-the-wool superintendent who likes to pass the buck to the overseers.

The constant lowering of wages, the increase of working hours and the foregoing of profit, to meet competition is the same as competing with ourselves. In the end it means the shut-down of a plant. Bear in mind that cut-price competition is a slow or fast death for some, and a mighty long drag for the survival of the fittest.

N. S. S. T.

Practical Helps for Overseers

Filling from Doff Box Emptied Mechanically

In several mills ingenious methods have been developed for emptying filling from doff boxes into the hopper of yarn conditioning machines. Such a device constructed for this purpose by the master mechanic of Piedmont Mfg. Co., Piedmont, S. C., consists essentially of two compressed-air cylinders and a system of levers which lift the box and empty it with a motion much like that of a phonograph with self-changing record attachment. The cylinders, which have a 4-in. diameter and 9-in. stroke, are operated under 60-lb. air pressure. The air valve is a regular stop-and-waste cock with a $\frac{1}{16}$-in. hole bored through the core, which is plugged with babbitt. Each piston rod is connected to a steel cable which passes over an 8-in. sheave to which it is anchored about three-quarters of the way around. A piece of angle iron, bent to fit the doff box, is bolted to the sheave in such a manner that it is in a vertical position ready to receive the box when the piston rod is extended. Two clamps hook over the top of the box at each end to hold the box in place during the dumping operation.

To operate the lift, a full box is pushed into position against the angle irons, the clamps are snapped over the top, and the air valve is opened. The remainder of the motion is automatic. Fig. 1 shows the various positions of the box during the operation.

A similar contrivance in use in another South Carolina mill has a single commercial air piston (with a very long stroke), suspended overhead, for lifting the box. The mechanism (Fig. 2) consists essentially of a cradle with a flat base resting on the floor. This base is connected by means of rigid vertical strips to the top edge of the hopper or apron leading to a yarn-conditioning

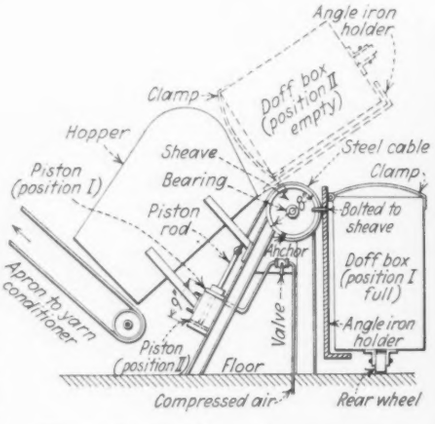


Fig. 1. Cross-section of compressed-air lift for doff box showing start and finish of dumping operation.

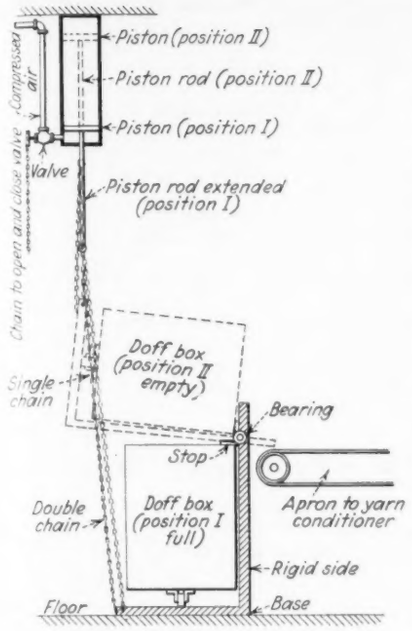


Fig. 2. Cross-section of overhead single-cylinder compressed-air lift for emptying doff box.

machine. To operate, a box is pushed on to the base and the air valve opened. As the piston rod recedes, the base and side swing outward and upward until the box is emptied. The air valve is then reversed and the box is returned to its normal position right side up on the floor.

Storage Charge Against Salvaged Equipment

The proper salvage of mechanical equipment will pay every plant, but there are countless instances of salvage that are by no means proper. The indiscriminate saving of mechanical parts is, in most cases, a direct loss of money. A gear goes bad: We examine the gear and, on looking up the price of a replacement, find it is a special which runs into quite a bit of money; it is possible to get a new one quickly, a machine is down and causing considerable loss; we put the new gear in place, and then wonder whether it will be profitable to repair and save the old one against a possible future breakdown. The same thing is true of a broken belt, of a valve or a pipe fitting taken out of the line and of many other items.

Stock of this nature can be repaired and stored. It can be kept in orderly array in storage, so that it may be found if, and when, needed. This process costs money. Over against this fact, it can be disposed of at once as junk for a very nominal sum. It is, therefore, quite a problem to decide whether it will, or will not, pay to save and store a given part. There must be a man at hand with wide experience in plant practice, if such decisions are to be made with any degree of accuracy. He must have access to prices on new parts, and, even with all the facts at hand, he will make some mistakes along these lines.

Conditions change continually, and with them values change. There are some valves out in storage in our plant which were taken out of the line a year ago, and which seemed to be the best kind of a bet for salvage. Today, we need a couple of valves just like them, were it not for the fact that the Blank Co. has introduced a much better valve two or three months ago and we have decided to make all replacements with the new valves. There can be no question as to the advantage of using the new valves. Therefore, we have some valves in storage which it cost us money to repair, classify, and store, and which must now be junked after all.

What will it cost to repair this part? What degree of probability is there that we shall have profitable use for it, and how soon will that probably be? What is its junk value, plus a reasonable charge for repairing and storing it, and how far short does this figure fall of the price of a new one, when a further reasonable amount has been added to cover probable depreciation due to obsolescence? These are questions that should be faced and answered in every case where the salvage of mechanical parts is in question. It must be admitted that, in the experience of most plants, all hair-line decisions should be turned against salvage of the part. There is such a thing as proper and profitable salvage, and it is folly to throw away anything at a real loss. Nevertheless, in most cases, a good slogan can be summed up in the words, "when in doubt, junk it."

JOHN E. HYLER

Regarding the Loomfixer

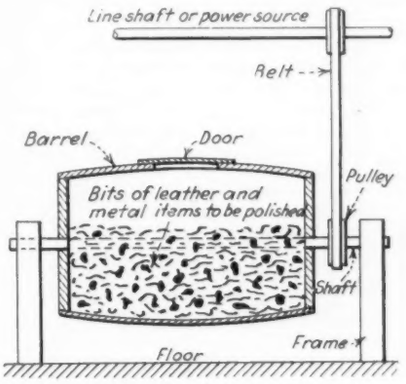
At our shop, green lights are fastened to the ceiling over the loomfixers' benches. When a loom breaks, the weaver goes to the loomfixer's bench, marks the time the loom stopped on a pad furnished for the purpose, and turns on a green light. The loomfixer comes to his bench, puts out the light, and goes to fix the loom. When he comes back, he marks down the time lost and the cause of the breakdown. If another fixer's light is on and he has the time, he helps out.

With this plan, the weaver does not have to hunt for a fixer, and the fixer does not necessarily have to stick to his bench, as the lights may be seen from various parts of the room. The savings are obvious.

VICTOR C. BORIS

Polishing Drum for Small Metal Parts

A time- and labor-saving device, in use in a number of mills, is an easily constructed polishing apparatus for flyers, drop wires, rings, and other small pieces of metal. As shown in the sketch, the polisher consists of an ordinary barrel with a shaft running through the center of each head, the ends of the shaft being supported on a framework. One end of the shaft is equipped with a pulley and connected to a power source which will turn the barrel at 15 to 20 r.p.m. The barrel, fitted with a door which can be tightly fastened, is about



Polisher for metal rings, flyers, drop-wires, etc., made of barrel. Sand or sawdust can be used in place of leather.

half filled with small bits of leather. To operate, the metal items are put in, and the whole is set revolving. Usually, one day is sufficient to remove all rust and to apply a high polish. If leather is not available, sand or sawdust will do almost as well.

Questions and Answers

Finishing Balbriggan

Technical Editor:
We should appreciate having you advise us what solution to use in finishing balbriggan to give this cloth a firmer handle. Also, will you give us any information you have on preventing balbriggan from rolling when it is being cut. (8301)

In order to give balbriggan underwear fabric a firmer feel and handle after bleaching and dyeing, we suggest that the material being processed in batches not to exceed 300 lb. This will require a finishing bath of approximately 600 gal. A finish can be made up by taking 20 to 25 lb. of tapioca flour, placing it in a barrel, mixing thoroughly with 4 or 5 in. of cold water, filling the barrel three-quarters full, turning on the steam, and bringing the tapioca up to a boil. After it has boiled about 10 min. add enough cold water to cool it down to about 180° F., and then add 5 lb. of a good 50% sulphonated tallow softener. Mix thoroughly and then add the entire contents to the dyeing or bleaching machine. Run the goods in this machine for 15 to 20 min., remove, hydro-extract, and dry.

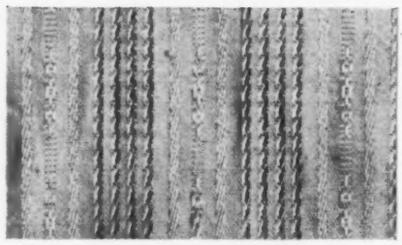
After drying, the goods are calendered. Some drying machines are equipped with calenders, so that the material can be dried and calendered in one operation. Fabrics finished in this way will have a firm feel and will lie flatter than untreated fabrics. If the fabric is too firm, the amount of tapioca flour can be reduced. If the handle is too soft, the amount of tapioca flour can be increased.

In reference to the processing of balbriggan to prevent it from rolling when being cut, we assume that you refer to the pasting of the edges, so that this fabric will lie flat. It is advisable in knitting to leave a needle out of the cylinder, which will make a guide mark throughout the entire length of the fabric. The fabric is dyed or bleached in the usual manner and hydro-extracted. It is then placed on a long board, which resembles an elongated ironing board, in such a way that the portion of the fabric with the needle out is on top of the board. A starch solution is made up, using 20 lb. of thin-boiling starch to 75 gal. of water and cooking for 30 to 45 min. A brush resembling a finger brush; that is, one about 2½ in. wide and 5 in. long is dipped in the paste solution and then rubbed on the fabric along the needle-out place, getting approximately the same amount of size on each side of the line. As the fabric is pulled off the pasting board, it falls into a truck. When the roll has been completely sized, it is dried in the usual manner. These fabrics are usually dried on a spreader type dryer, and it is a good plan to roll them up with the needle-out mark on one of the edges. The fabric is split by taking a large pair of scissors, having rounded ends, holding this against the fabric along the needle-out mark, and pulling and unrolling the fabric at the same time. The fabric is then spread out and folded in a single thickness and is ready to be cut, calendered, or otherwise finished. Naturally there is some loss of fabric, depending upon the width of the pasted seam, which is unusable for ordinary cutting-up purposes or for some rubber-coated or calendered fabrics.

Design for Shirting

Technical Editor:

I am inclosing a sample of shirting that has caused me some worry and I am wondering if the designer who originated it was not a bit balmy. The satin stripe repeats on five picks, the twill stripe repeats on six picks, and the dobby stripe repeats on 48 picks, making it necessary to have 240 bars in the dobby chain. I shall appreciate it if you will give me your



idea as to why such a simple pattern was complicated so needlessly. (8310)

You are correct. The designer of this pattern has disregarded the care that should be taken in laying out and weaving shirting fabrics. If a single-pick worm on the dobby were used, 240 chain bars would be required; but most all modern dobbies are now equipped with a two-pick worm, which would reduce the total chain bars to 120.

A six-harness sateen should be used, and the difference would not be noticeable. This would permit the pattern to be woven with 48 bars of chain, using a single-pick worm, or on 24 bars of chain, using a two-pick worm. The accompanying illustration shows how we would weave this pattern.

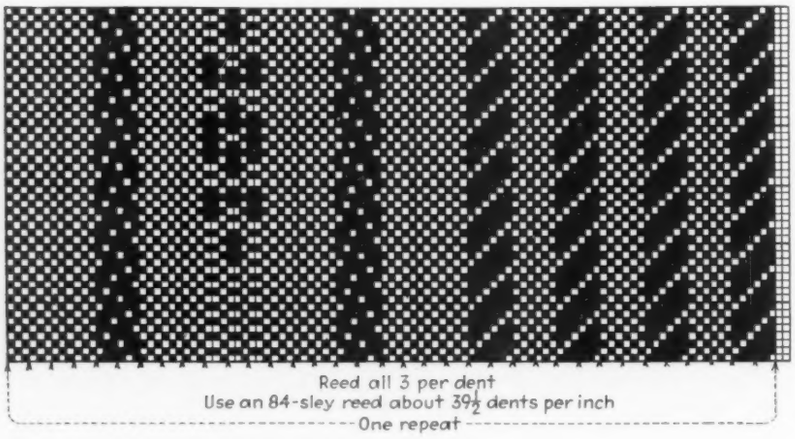
Frieze Blotchy

Technical Editor:

We are making a frieze coating; that is, a plain worsted warp with a frieze yarn filling. Occasionally, when these pieces come from the dyehouse, they appear very blotchy when pulled over the perch. They seem to be quite dry and the blotches do not seem to be dye stains. If these pieces are taken down to the wet finishing department, wet out, and again dried, the blotches disappear. What, in your opinion, causes these blotches? (8287)

Without seeing the cloth, we are unable to make a definite statement as to the cause of the blotches. However, there are two different possibilities which may account for the blotchy appearance. The most probable one is as follows: Cloth as it leaves the dyehouse is seldom absolutely free from small residues of dyeing assistants, such as glauber salt, etc. When the fabric is centrifuged or vacuum extracted, later local areas will always have more or less moisture than the remainder of the cloth. This is especially true if the cloth is allowed to lie around quite a while before it is dried. When finally dried, such areas appear as lighter or darker spots than the remainder of the cloth. The second wetting-out will tend to equalize any residues of dyeing or finishing materials, thus removing the blotches.

The second possible cause of the blotches is as follows: Frieze yarns if flattened give a different light reflection from the remainder of the more erect cloth. It is possible that because of contact with some uneven object while drying or because of lying wet for some time in a wrinkled condition before drying, some of the frieze yarn is flattened or caused to lie in a different direction from the remainder of the yarn. When the goods are finally dried, the different light reflection causes a blotchy appearance. A second wetting out usually erects the crushed frieze yarn, so that the blotch automatically disappears.



Spray Printing of Carpets

Technical Editor:

We desire to make plain-band, bordered, pile carpets with a 4- to 8-in. darker band on the outside edge of the carpet. This has been achieved by weaving the carpets to size in a plain color and superimposing a darker shade of the same color for the band. From information we have received, this can be done by printing with a block system, or spraying on the dye with a spray gun. Would you, therefore, forward to us any information you may have regarding the correct dye mixtures to use, methods of application, finishing, etc.? (8260)

If the edges of the carpets were to be printed with any kind of a design, we would recommend the screen printing process, rather than block printing, and you could employ the usual method with a squeegee or a spray gun, according to your convenience. Since the stripe is to be a plain border, there is no need of a screen or stencil, and you can use a plain strip of fiber board to protect the unprinted portions, and spray the color on the border evenly with a spray gun. This will require some practice before the operator becomes skilled in doing it evenly; but it can be done, just as operators become skilled in applying lacquers to automobiles by this method.

The choice of dyes is more of a problem. A simple solution of basic dyes in water plus a little acetic acid will produce any color that may be wanted and the color will fix itself in drying, but it will always be subject to rubbing off and will not have much resistance to light. It is possible to obtain spirit-soluble colors, which are dissolved in denatured alcohol and other solvents and which have excellent fastness to light. Sometimes there is added a little gum to act as a binder, but not enough to stiffen the pile of the fabric. Such products are now used extensively on table covers, scarfs, and even mufflers.

Soiled Knots in Rayon

Technical Editor:

We are having considerable trouble with soiled knots on 100- and 150-denier rayon. In making a thorough check, we find it is caused by the weaving reed in the weave shed. Before the reed is sent to the weave shed it is cleaned; but due to the atmospheric conditions of our locality, as we are situated where a

great deal of soft coal is used, there is an accumulation of dust and dirt between the dent wires, which is difficult to prevent. We understand there is a paste on the market which is smeared between the dent wires to prevent the accumulation of dirt. We shall appreciate greatly any information you have to offer to overcome this annoying condition. (8303)

We do not believe that your reed is causing this condition. If the reed were to blame, it would also have a tendency to soil the warp stock. It is our opinion that a paste would not be of any help, as it would have a tendency to accumulate the dust and dirt. There is, however, a paste which is used to remove the soiled spots after weaving, obtainable from almost any dealer in textile chemical specialties.

We believe that these so-called soiled knots are formed long before they reach the reed. If you will examine some of these knots under a magnifying glass before they reach the harness or reed, you will find that the majority of them have small dark specks, which become larger after they have been subjected to the reed friction. We do not know what method of weights you are carrying on your warps. However, if you are using ropes and are employing a graphite mixture to avoid rope marks, we can assure you that this is likely to cause soiled spots, as graphite will fly constantly and will light on the warp stock, reeds, harness, etc. When you are cleaning the reeds, use a little powdered lime and dust the reeds thoroughly. Instruct your warpers and weavers to use potato starch when they tie a knot. Do not have too big a shed on your loom.

Knot Kinks in Georgette

Technical Editor:
I am making a heavy 20-harnesses georgette crepe on a Crompton & Knowles loom, and I am finding it difficult to prevent knot kinks or "hang picks." I have set the eccentric motion on the four different positions; I had the whip-roll above and below the warp line; I also had the shed closed at front center and at ¼ in. and 1 in. from the fell of the cloth—and still no improvement. I shall appreciate your advice as to preventing these knot kinks.

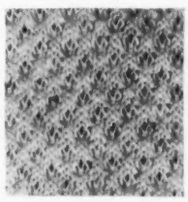
It has been our experience that in weaving cloth of this nature, regardless of what precautions are taken, this condition will be encountered. However, it can be helped somewhat. In our opinion it is best to have the eccentric motion operating on fast time. We also suggest that you have the shed set to close over front center. This helps the reed to straighten out the filling, thereby preventing the filling from hanging on the knots. In setting the loom over center, you will find that the pick shoes will have to be moved backward; otherwise you may run into difficulties such as shuttle flying out or chafing of selvages.

We recommend that you enlarge the shed slightly. Anything that you do to the whip roll will not be of help; but you will find that the later you close the shed, the fewer knot kinks you will have.

A different method of reeding the ends may help. Instruct your weavers to try and roll the knots when they see them and have the warpers use judgment in tying broken ends. Also have good fur in the shuttles, with a fair tension. It will help to insert a pin in the shuttle mouth.

Knit Fabric Sleazy

Technical Editor:
Inclosed you will find two pieces of cloth. The maize piece is the sample I received, and the white piece is my attempt to duplicate the maize piece. You will notice that my white cloth is very sleazy, shows prominent wales, and has no eyelet in the center. I have unraveled the sample and found one plain feed and three cut-presser feeds, cut two and two, all holding on the same needles, and two needles over in the cylinder. I am using single cotton 20s. I set the stitch on plain cloth as tight as I can go, 32 stitches to 1 in.; and, counting the wales on the sample, I find that the



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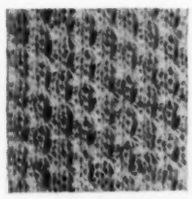

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sample is just one wale finer to ¼ in. I shall appreciate any information you can give me on the sample. (8298)

In the first place the maize sample is of considerably finer gage. We have checked the count of the wales and find that the maize sample has 24 per inch, while the white sample has only 18. For this type of stitch, we should judge the gage to be 28 or perhaps slightly finer. The cut-presser set-up is all right; and with yarn heavy enough to fill up the gage, there should be no trouble in duplicating the maize sample.

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CORRESPONDENCE

Uneven Picker Laps

I should like to add a few words to Mr. Weston's comments on uneven picker laps on page 77 of your December issue.

The pin-beater is primarily a breaker-beater. When first introduced, it was recommended for use on the breaker-pickers in those mills where the highly compressed Egyptian cotton was being used, and was an improvement over the solid-beater. If the pin-beater was used as the first beater, and the blade beater used as the finisher beater, better results would be obtained in the yard-to-yard condition of the finished laps. Practical experience has shown this to be so. But as to theoretical evidence that this will be so, let us take the first question as raised by Mr. Weston.

Is the cotton well opened before it is fed to the hopper or feed in back of the one-process picker? (the tufts should be small and fluffy—not large or hard). That is a condition which all are striving for. Use of the pin-beater as the first beater will practically assure us of that condition. The cotton will be presented to the evener-plates fluffy, and not hard; and, as these are affected by bulk or hardness, this soft fluffy condition will allow them to give more uniform results to the finisher-beater.

There is nothing new in the principle of the so called one-process picking, the principal advantage of which is that the continuous process makes it necessary to handle the cotton at the various beaters with much less compression. It has been the common way of handling the lower grades of cotton at the first opening stages. The thing that is new about the process is the using of the laps from this machine as finished laps.

As evidence that the machine in question is not adapted for the making of a finished lap, let me quote from a circular distributed by one of the leading makers, and a strong exponent of the one-process system. "Our engineers were baffled in their attempts to bring one process picker laps to the same degree of evenness as the three-process. Finally it was suggested that the variation in the laps was caused by improper blending and lack of doubling, and the intermediate feeder was introduced between the breaker and the finisher section to secure the effect formerly obtained by the doublings on the apron of the finisher in the old system. The improvement in the laps was instantaneous." This feature has again being changed with added beneficial results, the cleaning and blending attachment taking the place of the intermediate feeder. ROBERT BURGESS.

Personal News

Frederick Nuttall, formerly of New Bedford, has been appointed assistant superintendent of Farr Alpaca Co., Holyoke, Mass. This position had been vacant since the promotion of **Ralph Hood** who has been raised to the post of superintendent.

George Rutledge, overseer carding Easley Cotton Mills No. 3, Liberty, S. C., has been transferred to Mill No. 2.

C. A. Chandler, second hand carding, Woodside Cotton Mills, Greenville, S. C., has been made overseer carding, Easley Cotton Mills No. 3.

J. E. Ross, of Tifton, Ga., is now with carding and spinning departments of Piedmont Cotton Mills, Egan, Ga.

E. C. Burnham, of Sargent, Ga., has been made overseer spinning and twisting, Caroline Mills, Carrollton, Ga.

B. T. Mulligan, overseer carding Easley Cotton Mills No. 2, Liberty, S. C., has been promoted to overseer carding Woodside Cotton Mills, Greenville, S. C.

J. Arthur Boyd, formerly with Appleton Co., Anderson, S. C., but more recently of St. Louis, has been named overseer bleaching, Union Bleachery, Greenville, S. C. He graduated from Clemson, 1926.

F. E. Moulton, for the last sixteen years assistant superintendent at the Madison (Me.) Woolen Mills, has gone to Oxford, Me., as superintendent of Robinson Woolen Co., replacing **James W. Stanley.** Mr. Stanley has accepted a position with Merrimac Woolen Co.,

THE OVERSEERS' CORNER

MEET MR. CUTLER

Clarence L. Cutler, who contributes occasionally to these columns, heads the dyeing department of Arlington Mills, Lawrence, Mass., and has many outside interests. In the textile field, he is second vice-president of the National Association of Woolen and Worsted Overseers, fifth vice-president of the National Association of Dyers and Finishers, and a past president of the Arlington Mills Overseers' Association. His non-textile hobbies include swimming, boating, fishing, and a study of wild bird life.

Mr. Cutler attended Lowell Textile Institute and secured his first experience at Wood Worsted Mills of American Woolen Co., Lawrence. He was transferred to Puritan Mills of the same company, Plymouth, Mass., where he served as overseer of dyeing for nine years. He held a similar position for two years at Stillwater Worsted Mills, Harrisville, R. I., for two years at Riverside Mills of American Woolen, Providence, R. I., and for six years at Security Mills, Newton, Mass. Mr. Cutler joined the Arlington organization nine years ago.

Lowell, Mass., as assistant superintendent.

D. C. Turrentine has been made assistant superintendent of Mills Mill, No. 2, Woodruff, S. C.

R. W. Redston, formerly with Dominion Silk Dyeing & Finishing Co., Drummondville, Quebec, is now overseer of dyeing at Stetson Hat Co., Brockville, Ontario.

Lional Berard has resigned his position as overseer of finishing at George W. Watt Woolen Co., Norristown, Pa.

Bernard S. Hillman has recently accepted a position in charge of dyeing and finishing at Pacific Textile Processing Co., Hermosa Beach, Calif.

M. C. Chalmers, has been promoted from second hand to overseer weaving at Ware Shoals (S. C.) Mfg. Co., succeeding **E. T. Lollis,** resigned.

C. F. Patterson, overseer weaving, Cotton Mill Products Co., Mobile, Ala., has resigned to become loom fixer at Muscogee Mfg. Co., Columbus, Ga.

Frank Owens, formerly overseer of dyeing at Palmer Mills of Otis Co., Three Rivers, Mass., is now with Glenlyon Yarn Dye Works, Phillipsdale, R. I.

Thomas Parkin, overseer of warp preparation at Arlington Mills, Lawrence, Mass., has retired and will visit England, his native land. The Arlington Mills Overseers' Association held a banquet and presented him with an engraved watch. Mr. Parkin has served as president of the National Association of Woolen & Worsted Overseers.

Eric Turner has taken **Thomas Parkin's** place as overseer of warp preparation at Arlington Mills, Lawrence, Mass.

James L. Batts was elected president of the reorganized Pacific Mills Worsted Division Overseers. Other officers are: **Harry Lambert,** vice-president; **Andrew W. Silloway,** secretary-treasurer. The board of directors is made up of the three officers and **Charles Jewett, Earl Rutter** and **Charles Pollard.**

G. D. Holler, overseer of weaving at Alice Mfg. Co., Easley, S. C., has resigned to engage in another line of business. He is succeeded by **J. J. Leslie,** formerly loom fixer.

M. C. Smith has become overseer of cloth division, Rhodhiss (N. C.) Mills.

James E. Buchanan, head of the dyeing, bleaching, and finishing division of Seekonk Lace Co., Pawtucket, R. I., was tendered a banquet by his friends and associates last month upon the completion of a quarter of a century of service with the concern.

Claude Cline is now overseer of dyeing Silver Knit Hosiery Mills, High Point, N. C., succeeding A. B. Gammon.

Thomas G. Roche, textile engineering graduate of Clemson College, who has been connected with Pelzer (S. C.) Mfg. Co., has resigned to accept the position of overseer of spinning at Tucapau (S. C.) Mills.

George J. Accetta has accepted the position of rayon piece goods dyer at Goodimate Co., Philadelphia.

John H. Pickles is overseer of dyeing at Lang Woolen Co., Katahdin Mill, Corrinna, Me., where he succeeded **Chester Mathews.**

C. G. Davis, overseer of maintenance and power at Du Pont Rayon Co., Old Hickory, Tenn., has earned his 20-year service pin.

Frank Biery is now overseer of dyeing at Atlantic Mills, Stottville, N. Y.

Robert T. Stutts has resigned as overseer carding, Monarch Mills, Lockhart, S. C., to become superintendent of the Fountain Inn, S. C., and Simpsonville, S. C., plants of Woodside Cotton Mills Co., Greenville, S. C.

How Georgians Spin

And also how they card discussed at Operating Executives' spring meeting

CARDING and spinning problems were discussed at the spring meeting of the Textile Operating Executives of Georgia, held March 14 at the Georgia School of Technology, Atlanta, Ga. J. C. Edwards, general superintendent of Martha Mills, Thomaston, Ga., general chairman of the group, presided over the meeting. John B. Jones, superintendent of Shawmut plant of West Point Mfg. Co., West Point, led the spinning discussion. Frank L. Asbury, Jr., superintendent of Hillside plant of Callaway Mills, LaGrange, conducted the carding discussion.

Humidity Over Week-End

Chairman John B. Jones opened the spinning discussion with the question, "Do you favor running humidifiers in the spinning department over the week-end? Why?" Mr. Hampton said that he thinks it is a good practice to run the humidifiers over the week-end, providing the system is equipped with automatic controls which will cut off in time to prevent the room from becoming wet. Mr. Butterworth favored shutting off humidifiers, declaring that if they are in operation 2 to 4 hr. before starting time, humidity will be satisfactory. He cited some tests run over a period of one year which tended to prove that the greatest need is between 2:00 and 4:00 p.m. Mr. Edwards said that he has cut his controls to 40% relative, and has let them run over, but failed to get any better results except in extremely cold, wet weather. He now puts his humidifiers into operation about 30 min. before starting time. Mr. Durham suggested that a circulating system would be more practical to operate over the week-end.

The next question had to do with variation in yarn sizing and breaking strengths. Mr. Cobb has an average variation in yarn sizing of 12½%, and an average variation in breaking strength of 10% on 83s to 13s made from middling ⅞- to $\frac{15}{16}$-in. cotton. Mr. Elliott reported that he tries to keep his variation on heavy numbers, such as 14s, within 1 to 2%. On 25s to 30s he provides for greater variation. Cotton is from ⅞ to $\frac{15}{16}$-in. Mr. Thompson said that he gets a variation of 20 to 25% on 2½s to 30s, with a 6½% regain. Mr. Daniel has a variation of 15 to 20% under controlled conditions as to regain. Breaking strength varies from 20 to 25 lb. on 13s. A member reported that he gets considerably more variation on single roving.

Opinion varied somewhat as to when travelers should be changed. Mr. Moore said that 160 hr. on 42s filling is enough, since ends down increase after that time. Mr. Robinson changes half his travelers once a week, running 80 hr. Mr. Asbury changes every 160 hr. on 4s to 20s. Mr. Smith changes every third week on 14s warp and filling. A member reported changing every 240 hr. on 30s and 40s, with excellent results.

Long-Draft Spinning

The advantages of long-draft spinning were discussed. Mr. Moore reported that by changing over he eliminated one process, used the same cotton, and obtained a better break. Mr. Zachry said that he eliminated one process in the card room on 14s to 20s, and the intermediate process on 3s to 14s. On double-roving yarn of 14s to 20s and on single-roving yarn of other numbers, all made from $\frac{7}{8}$-in. cotton, he gets 10% greater breaking strength and shows a saving in the card room. Draft is 13½ to 14. However, a draft of 16 does not show an increase in breaking strength over standard draft. Mr. Edwards reported that, in changing over, he eliminated the speeder and makes a good 15s yarn from 1.05-hank roving, $\frac{7}{8}$-in. cotton. However, in order to make a better-quality yarn, he adopted a speeder, but sacrificed breaking strength upon going beyond 14½ draft. There was an increase in tensile strength to 14½ draft.

As to methods of paying doffers, Mr. Edwards prefers to pay by the side. Mr. Thompson pays by the hank. Mr. Hampton pays by the hour. There were many objections to each method of paying. It was pointed out that paying by the side encourages doffing short, paying by the hank encourages running the frames too long, and paying by the hour encourages loafing. It was agreed that each mill should work out its own system.

Consensus was that the recommendations of engineers should be taken with regard to the number of frames covered by an overhead or bunchless cleaner, since the tendency of the mill man is to cover too many frames with one cleaner.

The best relative humidity for long-draft spinning, according to several members, is from 55 to 60%, somewhat lower than the average humidity for ordinary spinning. There was some question as to the effect of an overhead cleaner on humidity. Mr. Edwards believes that an overhead cleaner amplifies the actual humidity. Incidentally, he has fans which blow off the ceiling, and once a week the ceiling is brushed down.

Several reasons and cures for filling sloughing off were given. Mr. Butterworth said that excessive humidity would cause filling to slough off, as would excessive speed in a loom. He suggested a regular system of inspection of both frames and looms. Mr. Alford remarked that a proper traveler and a firmly held bobbin would prevent trouble, pointing out that he has little sloughing off of 40s filling with 54 rounds per inch of stroke. Mr. Hampton finds that unevenly spaced cams help. Mr. Smith reported running "like wildfire" 7s to 26s with 1¼-in. stroke. Mr. Butterworth suggested that a 4-to-1 ratio cam could be secured if desired, in place of the regular 3-to-1 ratio.

Chairman Frank L. Asbury, Jr., opened the carding discussion by asking for suggestions as to the best method of removing small white neps from cotton, mentioning that Mr. Cobb had with him an infected sample of denim made of blue warp and white filling. Mr. Cobb displayed the sample and described it as looking like "a blue sky with a lot of stars around it." This year's cotton contains an unusual amount of neps, he said, and it varies in different localities. He reported having been able to eliminate some of the particles by grinding slower with a little closer setting on the cards, and by religiously keeping sharp card clothing. Leaving the mineral oil off the cotton in pickers was said to help. He cards an average of 16 lb. per hour, occasionally running as high as 19. Mr. Rambo said that he could sympathize with Mr. Cobb, since he himself had "looked at about 4,000,000 yd. of goods containing these neps." He uses $\frac{7}{8}$-in. middling cotton, and cards 15 lb. per hr. Mr. Jordan said that the best treatment for these neps which he has been able to develop is slow and light carding, regular stripping, reducing from 15 to 8 lb. per hour. He noted a slight decrease in stretch, and he strips every two or three hours with a vacuum system. Other members suggested speeding up the machine, taking out more strips, and keeping the card, clothing, lickerin, etc., in good condition. Mr. Oats reported that he has removed a large quantity of neps by using 120 wire, speeding up the flats 20%, and keeping the wires sharp.

Lap-splitting was said to be due to too great a distribution of roving waste; oversized, loose, and fluffy laps; excessive dampness and humidity; uneven distribution; and improper handling by picker men. In order to overcome lap-splitting, waste should be uniformly distributed, with a current of air just strong enough to carry the cotton forward, and with the major portion of the draft on the top screen.

***SUBJECTS** discussed at the meeting reported here include running humidifiers over week-end, variations in yarn count and strength, changing of travelers, long drafts, paying doffers, sloughing off of filling, neps, lap-splitting, card grinding, and straight-wire card clothing.*

J. C. Edwards, who presided at meeting of Georgians

Practice on Good Grinding

With reference to card grinding, Mr. Edwards said that he uses 110 wire on the cylinder, 120 on doffers and flats; operating speeds are 172 r.p.m. on cylinders, 276 r.p.m. on doffer wire while grinding, and 172 r.p.m. on cylinder wire while grinding; grinder-roll speed on cylinder is 596 r.p.m., on doffers 585 r.p.m. He uses No. 7 emery and cleans it with gasoline after every tenth card. Solid wheels are resurfaced every 1,000 hr. Mr. Harvey uses No. 40 emery with 100 wire on the cylinders and 110 on the flats. Mr. Belden uses No. 40 emery with a grinding speed of 3,600 ft. per minute. There was considerable difference of opinion as to whether high or low grinding speeds are better.

Worn card clothing was reported as lowering breaking strength of yarn as much as 5 to 7% and causing a variation as high as 27%.

Straight-wire card clothing was reported as giving good results for the first 12 to 18 months, after which period it has to be stripped as often as regular wire, according to Mr. Edwards. Mr. Bowes complained of its becoming dull. He grinds every 14 hr.

Piecings-in are best worked in on the slubber because of a difference in weights between breaker and finisher drawings, according to Mr. Elliott. Mr. Bowes returns it to drawing.

From the standpoint of economy, it is better to double in the card room and run single roving in the spinning room, said Mr. Rogers. Several members insisted that it is better to double in the spinning room, especially from angle of smoothness and evenness.

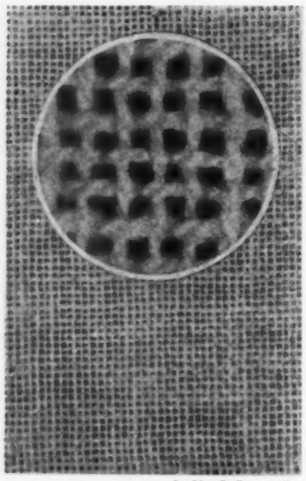
R. E. Field, Jr., of Newnan, Ga., was elected to executive committee.

STAPLE COTTON FABRICS

By John Hoye

Constructions, finishes, and uses

OF COURSE you can begin this series of articles at this point, but don't neglect your education! If you want to make your knowledge of the 100 or more staple cotton fabrics as complete as possible, and have failed to read the first three articles, we advise you to turn back at once to your copies of the January, February, and March issues. Those articles discussed cheese and tobacco cloths, print cloths, fine plains, carded and combed lawns, clipped-spot lawns, organdies, airplane cloths, balloon or typewriter cloths, oxfords, pongees, and voiles.



Iselin-Jefferson Co.

SCRIM
48″, 24x24, 3.40 yd. per lb.
2-ply yarns warp and filling

Scrim

Scrims are strong, open (or low-count) fabrics similar to voiles, although of lower construction. Carded ply yarns are used, heavier than those in voiles. Scrims are usually plain woven—sometimes with a fancy border along each selvage. They are also made in colored stripe and plaid effects. Better qualities are made with combed yarns.

Finishes used: Plain, mercerized, heavy-starched, glue adhesive buckram, and dry-starched flexible.

Uses in finished state: Curtains, draperies, and millinery (cap fronts, hat crowns, hat rims). Usually white and ecru for curtains and draperies, and white and black for millinery.

Examples of Standard Gray Constructions
(As quoted)

48″ 24x24 3.40 20/2 warp and filling
36″ 24x24 4.30 2-ply warp and filling
36″ 24x24 4.88 2-ply warp and filling
36″ 40x30 5.50 2-ply warp and filling
40″ 30x28 5.15 2-ply warp and filling
28″ 34x34 5.65 2-ply warp and filling

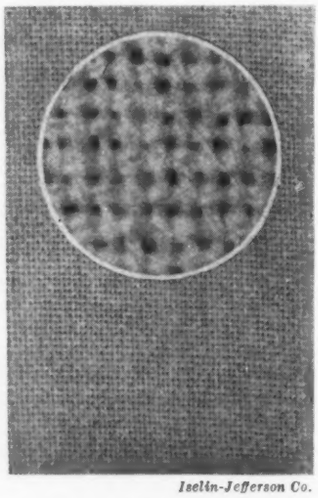
Scrims are also made with 3-ply warp and filling yarns.

Beach Cloth

Beach cloths are strong, heavy fabrics similar to coarse sheetings but lower in construction and made with carded ply yarns. Similar also to scrims, but heavier. Usually converted into flag bunting for railroad flags, printed draperies, and mercerized and dyed suitings and dress fabrics.

Examples of Standard Gray Constructions
(2-ply yarns in all cases)

36″ 36x36 2.70	37″ 36x30 3.00
60″ 36x36 1.26	37″ 36x36 2.75
40″ 28x28 2.75	37″ 38x40 3.29



Iselin-Jefferson Co.

BEACH CLOTH
37″, 36x30, 3.00 yd. per lb. 2-ply yarns warp and filling

Marquisette

Marquisettes are light-weight, sheer, open-texture fabrics, usually woven in a gauze or leno weave, in which the warp threads are crossed over each other before each pick is woven. This manner of weaving, sometimes called "doup" weaving, gives the cloth strength and prevents the slipping of the yarns, which in an ordinary open-weave fabric might become displaced. These cloths are also made with fancy leno weaves, colored or fancy woven borders, check effects, all-over designs, and plain- and colored-yarn clipped-dot effects. Various qualities are also made with cotton warp and rayon filling.

In all marquisettes, strong, wide, closely woven tape selvages in a plain weave are used so as to give strength for the stretching or framing of the goods in finishing and afterwards in laundering.

The best qualities are made with combed ply yarns, usually 100/2. In some cases the yarns are also gassed so as to give as sheer an effect as possible in the woven cloth. Other qualities are made with combed single yarns, and several lower qualities are made with carded single yarns.

Finishes used: Usually plain or mercerized. Dyed in tan or ecru shades, as well as printed. Framed out in finishing to almost gray width.

Uses: Curtains, dresses, mosquito nets, etc.

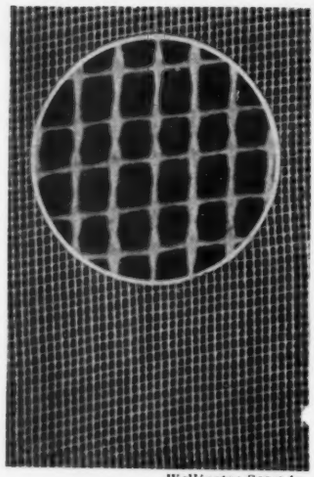
Examples of Standard Gray Constructions Combined:

48″ 54x34 100/2 warp and filling
40″ 54x34 100/2 warp and filling
48″ 54x34 50s warp, 100/2 filling
40″ 54x34 50s warp, 100/2 filling
40″ 60x40 9.00—all singles
40″ 60x34—all singles
49″ 52x30—all singles
39″ 48x24 10.22
39″ 48x20 12.40—clipped dot design

Carded (Weight not usually stated)

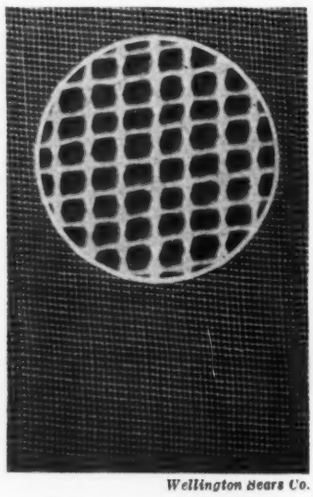
39½″ 54x30	39½″ 48x22
39″ 48x32	39½″ 46x22
39½″ 48x28	39½″ 44x18
39″ 40x18	

36″ 40x18 7.20 yd. per lb.



Wellington Sears Co.

MARQUISETTE
39½″, 48x20, carded



Wellington Sears Co.

MARQUISETTE
40″, 54x34, 100/2 combed, gassed w. & f.

LICKERIN DAMAGE

By Robert Burgess

Can be minimized by careful attention to speeds and settings

THE lickerin is one of the most important features of the card, in that it can do more harm to the cotton fibers than can any other mechanism. And it can do this damage in such a way that one may little suspect what is actually taking place. The action of the lickerin resembles that of a buzz saw, and this action may be so severe that it will damage the fiber to the extent of actually shortening the length of the staple. Then, of course, there are all the various stages of damage that are possible up to that extreme.

For any change that is made in the length or quality of the cotton or any change that is made in the draft of the card, there must be a corresponding change in the setting of the feed-plate or in the speed of the lickerin. Settings and speeds will be controlled by the type of feed-plate being used, and they must be co-ordinated in such a way that the lickerin will be able to take care of whatever the feed has to offer. In this, as in many other things which enter into the making of yarn, one must be his own judge as to the soundness of his methods of procedure. You can readily get the speeds and settings that others are using. But how about your cotton and general conditions? There may be a slight difference in the length of the staple or in the quality of the fiber; and these slight differences must not be ignored.

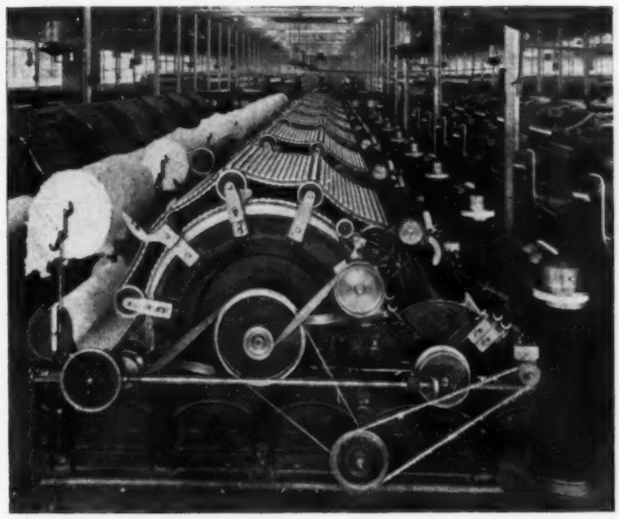
A Sure Guide

It may need careful analysis to learn just what the lickerin is doing. You must make sure that the cotton coming through the card is just as good cotton as it was before it entered the card. In making this test, you are interested in finding out the best in the way of staple that the carded cotton has to offer. But the thing which you are most interested in is whether the longest fibers in these pulls from the carded cotton are exactly the same length as the longest fibers in the cotton before the carding operation took place. It is this test that will tell you just what the lickerin is doing. And the condition in which you find the carded fiber is a sure guide—and the only guide that you need.

The actual speed of the lickerin in its relation to the cotton is not to be based entirely on the speed at which the lickerin is made to revolve; the speed at which the cotton is being fed into the lickerin and the setting of the feed are important factors in determining this. A comparatively slow speed of the lickerin will, with the aid of a long draft, be converted into a higher speed, in so far as the contact of the teeth of the lickerin with the cotton is concerned; but the slower speed does have the advantage of not being so harsh in its treatment of the fiber.

With cotton $1\frac{1}{8}$ to $1\frac{1}{4}$ in. in length, strict to good middling in grade, and with a card draft of about 125, a lickerin speed of about 380 r.p.m. should give satisfactory results. This speed will also meet conditions brought about by the use of shorter cotton and a shorter draft, if care is given to the setting of the feed. If longer cotton is used, which would of necessity call for a longer draft, it would be well to consider reducing the speed of the lickerin to about 275 r.p.m., this in addition to care in settings.

The lickerin will of necessity do a certain amount of fiber cleaning. However, the chief function of the lickerin is that of separating the fibers from the mass of cotton brought forward by the lap and presenting them in a suitable form to the cylinder.



It is interesting to note the deductions on lickerin speeds made by Horace Spibey (TEXTILE WORLD, December, 1932). According to Mr. Spibey, experiments made at the College of Technology, Manchester, England, indicate that lickerin speeds commonly employed are considerably lower than the safety of the card wire and the cotton requires, and that a higher speed results in stronger yarn. In giving close consideration to what he has to say, one must of necessity come to the conclusion that this was just an experiment with speed, with no attention being given to settings or other conditions. While these experiments gave the theoretical information desired, they can hardly be classed as practical manufacturing experience. On the other hand, it may be that one has a right to expect that the results would be relative.

The present writer is inclined to think that the increased breaking strength of the yarn after the loss of so much of the long fiber is due to a corresponding greater loss of the short fibers brought about by the high speed of the lickerin. His experience has been that the slow speed properly coordinated will give the best results. This is especially true where the counts being made are about the limit of the capacity of the staple.

The lickerin plays a prominent part in the work that is done by the card; and it should be given the careful attention which it deserves and requires. When the card clothing—on the cylinder and the doffer—is being given its periodical attention in the form of grinding, the lickerin should be examined carefully and the teeth put in good condition. Most important of all, it should be given a good burnishing, with a burnishing brush made for that purpose. At least once a year the lickerin should be re-ground.

Never lose sight of this fact. The lickerin can do more damage to the fiber without your knowing it than any other process through which the cotton is put. Whenever a change is made in the work that the card is doing, a careful inspection of the product is the only safeguard.

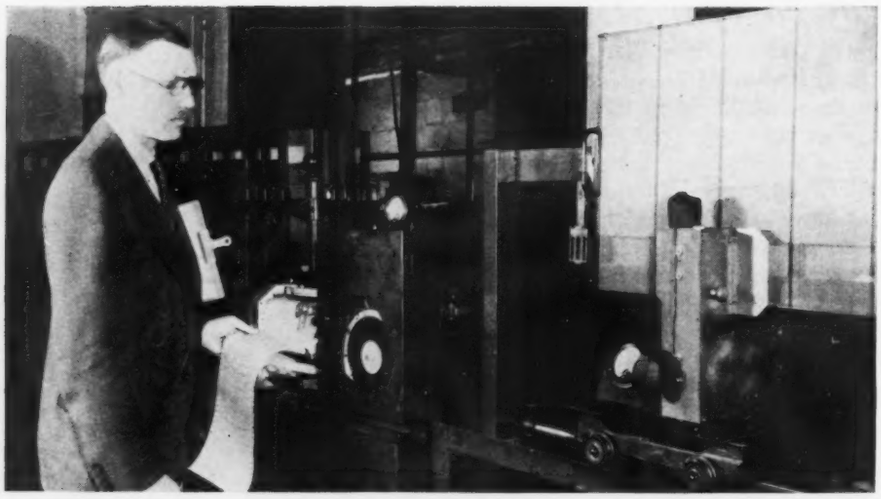
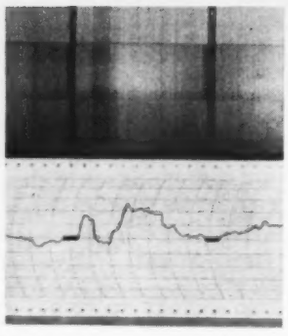


Photo-Electric Cell Adapted to Raw-Silk Grading



For grading and automatically recording the evenness quality of raw silk, United States Testing Co., Inc., 1415 Park Ave., Hoboken, N. J., announces development of the Evenometer. This instrument, which makes use of a photo-electric cell, eliminates the human element with its variations in eyesight and opinion. In addition, it discloses differences in evenness of lots having the same denier size, but different average diameter sizes —a differentiation not offered by previous tests.

Evaluation of unevenness is carried out as follows: Raw silk is wound in the customary manner on a special seriplane board equipped with a slot running from one end of the board to the other. A beam of light is directed, from behind the board, through the slot so that the rays, which pass between the threads, fall upon the sensitive surface of a photo-electric cell. The light falling on the photo cell causes it to emit an electric current; and the quantity of electric current is directly proportional to the amount of incident light. The number of threads wound in a given length of the seriplane board is always the same, and the light spaces between the threads will vary inversely as the thread diameters. Since the light which falls on the phototube must pass through the spaces, the amount of light, and the resultant quantity of electric current, are also accurate indicators of the thread diameter.

A light beam and photo-tube is moved at a constant speed along the slot from one end of the board to the other, thus scanning the silk on each panel. Since the light beam is wide enough to cover but nine threads at a time, the Evenometer virtually takes a complete series of successive 9-meter readings. At every instant the electric current from the photo-tube circuit is a measure of the mean diameter of one 9-meter skein. This current is now fed into an electronic accumulator which adds up all the current values of all the 9-meter skeins. The total current registered by the accumulator will naturally be inversely proportional to the average diameter of all the 9-meter skeins. By experimentally correlating the two, the result may be expressed as "the average micron diameter." This average diameter size of the sample is the size which it is expected will have the predominating effect on the finished fabric.

The next and most important step is to find out how much of the sample is not of average size and what its variation from the average may be.

Knowing the average diameter of the silk, one also knows the exact value of the photo-tube current when the 9-meter skein being scanned is of average diameter. If then, the photo-tube output current is opposed with a second current which is made and maintained exactly equal to it, the final output from the circuit is 0. For instance, suppose the photo-tube current has a value of 10 and it is opposed by another current of value 10; the total output is the difference between the two, which is 0. Now suppose the photo-tube scans the next skein which is finer than average and its current increases to 12; the difference between 12 and 10 is 2, which is the circuit output. Suppose the photo-tube now scans a skein coarser than average, causing the photo-tube current to drop to 8, the difference between 8 and 10 is 2, which again is the measurable output. In other words, the electric eye indicates the exact extent of the deviation in skeins which are coarser or finer than average.

With this arrangement, all that is necessary is to re-scan the silk as before, and the accumulator will register the sum of the deviation. However, the mathematical procedure requires that the results be expressed as the sum of the squared deviation. Consequently, before making the summation, the output of the photo-tube circuit is fed into a special square-law amplifier. Thus, at each instant the current going into this amplifier is equal to the deviation; and the current coming out is equal to the square of the deviation. This squared current is then fed to the accumulator, which records the answer, the average of the sum of the squared deviations, or the variance, expressed in microns. It is customary to express the unevenness as the ratio of the variance to the average diameter. If the variance has a value of 5 against an average size of 50, the ratio is 5/50, and the unevenness is 10%. But if this same variance of 5 occurs in an average size of 100, the ratio becomes 5/100, and the unevenness is only 5%.

Different lots of the same denier size have been found to have widely different average diameter sizes. Thus, two lots, both 14-denier and both having a variance of, say 10 microns, would have different evenness values if their average diameters were not the same. If one lot is 44 and the other a 51 micron average diameter size, their respective evenness grades would be 77% and 80%, a difference well worth knowing.

At the end of the test the Evenometer has determined: (1) the true average diameter size of the yarn, (2) the standard deviation, and (3) the mean squared deviation or variance, all expressed in microns. A logical measure of the unevenness can be expressed by showing the ratio of variance to the average diameter.

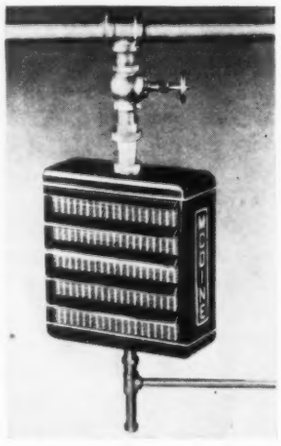
Dresser Reel

A new Rindge-type dresser reel has been announced by Davis & Furber Machine Co., North Andover, Mass. As shown in the illustration, the reel forms a cylinder on which the yarn is supported around the entire reel circumference. This construction is to give a more even tension on the warp, and thus to promote better weaving. The Davis & Furber pinless attachment is used in connection with this reel to save time when starting a new warp, or a new section, and to prevent section marks in the cloth.

This reel is built to hold very long warps, and sections may be built 9 in. high. One mill which has installed this type of equipment is putting two warps on a reel before beaming off. This provision for making long warps, in conjunction with the use of loom beams with 30-in. heads, brings important weave-room savings.

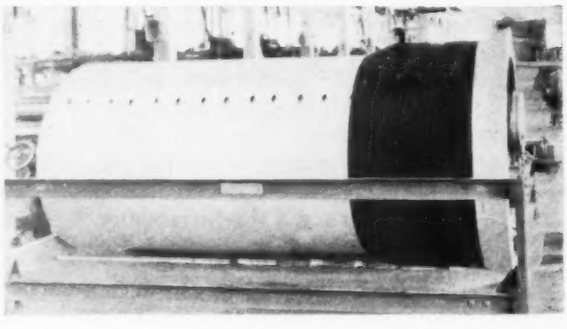
The drive is by a geared-head motor, with change gears provided, which offer a wide range of speeds. The control mechanism is located at the hack stand where the dresser tender stands. Electric brakes are included in the electrical equipment, and are thoroughly automatic. The reel can be stopped in 12 to 18 in. if an end breaks down when running at high speed.

While this new reel was developed primarily for use with the new Davis & Furber system of high-speed warping for woolen and worsted mills, it is said to be suitable for any system of dressing, whether running 25 or 500 yd. per min. The reel is built low and sturdy and has been designed to give a minimum of air resistance. Hence it is described by the manufacturer as being "streamlined."



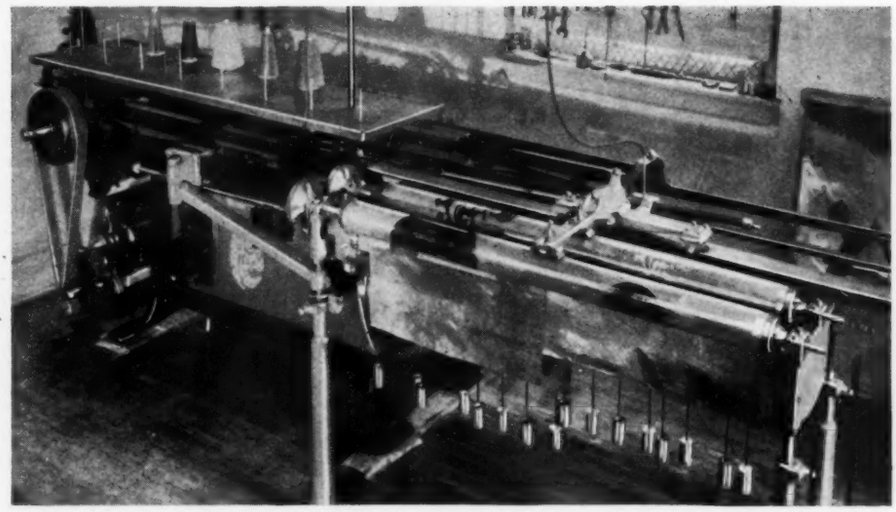
Unit Heater for Lint-Laden Air

Modine Mfg. Co., Racine, Wis., has developed the Tex-Type unit heater, which is planned to operate satisfactorily under severe lint conditions. Its construction is such that condenser clogging is said to be greatly reduced, and, in many cases, eliminated. Lower maintenance cost because of the decreased need for blowing out, and more uniform temperature are featured.



AND PROCESSES

High-Speed Silk Warping

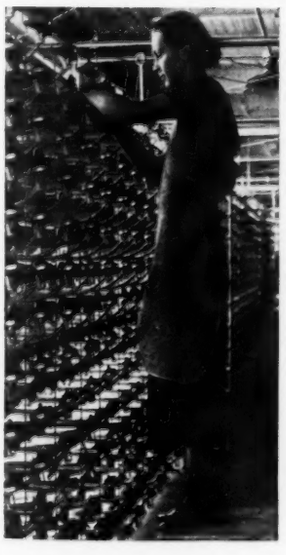


High-speed warping of silk is made possible by recent refinements in the over-end magazine creel brought out a few years ago by Sipp-Eastwood Corp., Paterson, N. J. The original equipment (TEXTILE WORLD, Oct. 31, 1931) has proved highly successful for handling rayon, and the improved model is expected by the manufacturers to be equally advantageous for warping silk where the mill is operating on comparatively long runs of the same type of warp. A Pennsylvania silk manufacturer, who has just completed installation of one of the new creels, reports that he was able to obtain a speed of 220 yd. per min. on the first warp. This warp, which was 1,600 yd. long with 21,042 ends, was completed in 12½ hr., as compared with the 21 to 22 hr. required on older types of equipment. It is estimated that it will be possible to attain a speed of around 300 yd. per minute, cutting the time required to complete a warp to 9 or 10 hr.

Aside from the economies effected through increased speed, the elimination of "skins," which is accomplished by the magazine feature, is said to give a further saving, which in itself should repay the cost of the creel in about 12 months. A further advantage cited is that a uniform, predetermined tension is maintained throughout the length of the warp.

As on the earlier models, each spool-carrier bracket forms a complete unit with the tension device, the latter being so constructed that, in the event of an end breaking, an electrical contact is made which flashes a light on top of that particular row and, at the same time, stops the warper. The tension device itself, however, is quite different from that on the creels for rayon. This device consists essentially of two parts—a primary tension and a secondary tension. The primary tension is controlled by means of a felt washer over which are placed two corrugated metal disks. The silk passes over-end from the spool, between the corrugated disks, and then to the secondary tension. This secondary tension can be described simply as a ball-bearing-mounted, rubber pulley, revolving on a porcelain pin. The silk contacts about three-quarters of the circumference of the rubber pulley and then goes through porcelain guides to the condenser. The primary tension is self-cleaning, being set at such an angle that any gum rubbed from the silk does not adhere to the corrugated disks to cause sticking and breaking of the thread, but falls to the floor. Use of the new tension device in conjunction with a special over-end spool, has contributed largely to the adaptation of the creel to the needs of silk manufacturer. The spool, which is fitted with a metal tail-tie plate, was developed by Lestershire Spool & Mfg. Co., Johnson City, N. Y.

Two other recent Sipp-Eastwood developments which have facilitated high-speed warping are an improved condenser comprised of porcelain guide eyes set in a transparent frame, and a semi-automatic leasing device which obviates a considerable part of the manual effort formerly required of the warper tender.



Electrical "Jacquard"

Paint your jacquard design on a copper sheet, forgetting all about courses and wales if you are a knitter and all about ends and picks if you are a weaver, mount your copper sheet on the knitting machine or loom, and watch the design reproduce itself in the fabric. That is the goal, already realized in the case of knitting and promised early in the case of weaving, afforded by a new attachment from France offered to this country by the Lefier Corp., 35 West 32nd St., New York. The invention is reported to reduce materially the time and expense of preparing and mounting jacquard designs and to make possible quick change-overs and extensive design experimenting or sampling at low cost.

The Lefier device was invented by one Yves Ruinnet and was patented in this country (U. S. Patent 1,795,235) on March 3, 1931. George Fisher, who has had a wide textile experience in Europe and was formerly general manager of the British Textile Impregnating Co., is in direct charge of the introduction, building, and marketing of the device. Also interested in the Lefier Corp. are Lehman Brothers, bankers, and Milton Erlanger and Alfred Flesh, of Erlanger Mills. Parts will be built by independent shops to specification, and assembling will be carried on in a special plant to be located in the New York area. The model now on demonstration in New York will be shown at the Philadelphia Knitting Arts Exhibition this month.

This model is applied to a Dubied two-bed flat knitting machine, as shown in the accompanying photograph. The copper sheets are hung on rollers, one roller for each color in the design additional to the ground color. For the sake of clarity in this description we shall term these rollers the "design rollers." From a radio-type transmitter plugged into the electrical system of the mill a current of electricity of only .02 amperes, which is too weak to be felt by anyone coming in contact with it, is fed by a distributor first to one design roller and then the other, thereby charging the two copper sheets on one roller during each course of the knitting.

At each traverse of the knitting-machine carriage (not visible under the cone shelf at the left of the photograph) an arm which extends across both design rollers traverses the length of those rollers. In the photograph the arm is shown at a point about half-way along its traverse. From this arm are suspended two small contact rollers, one for each design roller. Where one of these contact rollers encounters the bare surface of a charged copper sheet, it completes the electric circuit. Where it encounters the painted design, however, the circuit is broken. The weak, interrupted current in this circuit serves to relay a stronger, similarly interrupted current to an electromagnet having a location and purpose to be explained later. After each course the design rollers turn slightly to present a new stich row of the design to the contact rollers.

The electromagnet travels in synchronism with the knitting-machine carriage, its hammer passing over a series of levers, one lever per needle, located in a special grid behind the rear needle bed. When the current is interrupted by the paint on the copper sheet, the hammer falls to a low position and, by a camming action, forces the levers down as it encounters them in its travel. When the contact is again made with the bare copper, the hammer rises and passes over further levers without touching them. The levers serve to push the selected needles into position to knit the design in a thoroughly orthodox manner. In fact, except for the replacing of the usual jacquard with the lever grid, the knitting machine itself is in no way affected by application of the Lefier device.

Although, on the model now being demonstrated, the rollers for the design sheets and the contact rollers which ride on them are driven mechanically from the knitting machine, Mr. Fisher points out that a synchronized electrical drive could be worked out that would permit the designing element to be located at a distance from the knitting machine—even in a separate room. As now demonstrated, the device has only two design rollers and therefore produces a design in a total of only three colors, but Mr. Fisher emphasizes that any number of rollers, and hence colors, can be employed. The copper sheets, which are inexpensive in the first place, may be used a considerable number of times.

Industrial Chair

An industrial chair that can be adjusted for any individual without the use of screwdriver or wrench, and which does not make use of bolts, nuts, or wheel hands, has been designed by Harter Corp., Sturgis, Mich. The model is constructed with a 1-in., tubular-steel base. The seat is supported on a square, cold-rolled-steel spindle, with a tapered keyway permitting instantaneous adjustment of seat height.

THE PERSONAL PAGE

W. D. Anderson, Sr.

Frank R. Scull

Thos. H. Webb

William D. Anderson, Jr., vice-president of Bibb Mfg. Co., has been made president upon the retirement of his father, **William D. Anderson, Sr.,** president and chairman of the board. Mr. Anderson, Sr., will continue to serve as chairman of the board. **James H. Porter,** executive vice-president, retired to become vice-chairman of the board. **A. A. Drake,** secretary and treasurer for a number of years, was made vice-president and secretary. **P. E. Finlay,** in the sales department for the last 31 years and sales manager for a long period, became a new vice-president. **Charles C. Hertwig,** assistant secretary and treasurer, was promoted to treasurer. **H. J. Bivins,** office manager, was elevated to assistant treasurer, and **O. S. Neylands,** auditor and credit manager, became assistant secretary. Both Mr. Bivins and Mr. Neylands will continue in charge of the departments they have been heading. Mr. Anderson, Sr., emphasized, in making the changes which have long been under consideration, that he and Mr. Porter would be active advisors to the new heads of the corporation. The new president is 36 years old, having served as salesman, sales manager, and vice-president in charge of sales since his graduation from the University of Georgia in 1921. Substantially, the entire business experience of those promoted has been with the Bibb organization, a $20,000,000 corporation which maintains its own sales force from coast to coast.

R. C. Dick, treasurer of Louisville (Ky.) Textiles Inc., has been appointed treasurer and general manager of Naumkeag Steam Cotton Co., Salem, Mass., succeeding the late Dexter Stevens. Mr. Stevens died a few weeks after his appointment in February. **Lincoln Baylies** was recently appointed assistant treasurer. Mr. Dick, who is 44 years old, graduated from New Bedford Textile School in 1913. After connections with several textile mills, including Cabot Mfg. Co. of which he was assistant agent, he joined Lockwood Greene & Co. in 1920, being employed by that company on various manufacturing and merchandising problems. In June, 1930, he became vice-president and treasurer of Louisville Textiles Inc., where he has made a good record during difficult years.

Thomas H. Webb, president, and **C. W. Byrd,** secretary and treasurer, of the Locke Cotton Mills, Concord, N. C., have resigned. Mr. Webb is succeeded as president by **Fred L. Smyre,** of Gastonia, and Mr. Byrd is succeeded by **W. L. Steele,** of Winston-Salem. Mr. Webb, who has been with the Locke company for 20 years, is president of the American Cotton Manufacturers Association. His plans for the future, and those of Mr. Byrd, have not been announced.

Frank R. Scull, former sales manager of the acetate department of duPont Rayon Co., has been appointed to do special work for Tubize Chatillon Corp., as reported last month. The change was interpreted by many in the market as confirming previous reports that Tubize will shortly resume commercial production of acetate yarn.

F. P. Bacon, who has sold his interest in the Southern Mercerizing Co., Spartanburg, S. C., has taken over active management of the Mountain Industries and Appalachian Hand Weavers, Tryon, N. C., which he owns.

R. L. Whitman, formerly vice-president in charge of sales and treasurer of Esmond (R. I.) Mills, joined the Nashua (N. H.) Mfg. Co. organization on March 30. Mr. Whitman will be in full charge of sales and merchandising. **Richard Lennihan,** executive vice-president, resigned, effective July 1.

Emerson G. Gaylord and **John G. McCallan** have been added to the board of directors of Farr Alpaca Co., Holyoke, Mass., replacing **William Skinner, 2nd,** and **Aaron C. Bagg.**

Theodore Boettger was elected chairman of the board of United Piece Dye Works, Lodi, N. J. Other officers are: **Albert Blum** and **Henry Blum,** vice-chairmen; **R. Boeringer,** president; **Robert Boettger,** secretary; and **William H. Macdonald,** treasurer.

P. O. Ferrel, vice-president and sales manager of Real Silk Hosiery Mills, Indianapolis, Ind., has been elected a director of the company.

G. T. Fisher has been selected as secretary-treasurer of St. Pauls (N. C.) Cotton Mills Co., Inc., succeeding the late A. R. McEachern. **W. T. Maddrey** was chosen assistant secretary-treasurer.

Henry Thompson, Jr., has resigned as vice-president of United States Finishing Co., New York.

W. C. Vereen, president, Moultrie (Ga.) Cotton Mills and president, Moultrie Banking Co., returned home last month from Johns Hopkins Hospital, Baltimore, where he underwent a successful operation for removal of a cataract which had affected his sight.

A. G. Furman, Jr., of Greenville, S. C., has been elected a director of the Southern Bleachery & Print Works at the annual meeting held in New York. He succeeds the late Jas. F. Gallivan.

William King has severed his connection with Titus Blatter & Co., drapery converters, 164 5th Ave., New York, after more than 34 years service. Mr. King will continue in the same line and has established temporary offices at Buckingham Hotel, New York.

Herman Weisler, superintendent of knitting and dyeing at the Hopewell, Va., plant of Tubize Chatillon Corp., has been appointed manager of that plant succeeding **Raymond S. Burrows,** who resigned to become technical director of the Brazil firm which bought Tubize's nitro plant.

John T. McManus, general manager, S. Slater & Sons, Webster, Mass., has resigned after 30 years with company.

George M. Stevens, who has had extended knitting experience with Coopers, Inc., Kenosha, Wis., and Bradley Knitting Mills, Delavan, Wis., has become associated with a new business department, Textile Banking Co., New York.

E. P. Cogswell, superintendent, Chadwick-Hoskins Mills, has resigned; no successor has as yet been announced.

Jack Donaldson, sales manager, Nashua Mfg. Co., has resigned that post.

Harry T. Viall, who recently joined the sales department of Hope Webbing Co., Pawtucket, R. I., has been placed in charge of the New York office of that company.

Ivan Harlow was chosen vice-president and **P. L. Proctor** was made treasurer at a recent meeting of the board of directors of Bellman Brook Bleachery, Fairview, N. J., **B. I. Ward,** president announced.

W. H. Broadhead, formerly superintendent, Camden (Me.) Woolen Mill, is now associated with the Brookside Woolen Co., Glastonbury, Conn.

Textile Calendar

Thirty-second Annual Knitting Arts Exhibition, Commercial Museum, Philadelphia, April 20 to 24, 1936.

National Association of Hosiery Manufacturers, annual meeting, Commercial Museum, Philadelphia, Apr. 22, 1936.

Underwear Institute, annual meeting, Commercial Museum, Philadelphia, April 23, 1936.

North Carolina State College Style Show, Raleigh, N. C., April 23, 1936.

Eastern Carolina Division of Southern Textile Association, Raleigh, N. C., April 23, 1936.

Southeastern Section, American Association of Textile Chemists & Colorists, spring meeting, Thomas Hotel, Auburn, Ala., April 25, 1936.

American Cotton Mfrs. Assn., Annual convention, Pinehurst, N. C., Apr. 30-May 2, 1936.

United States Institute for Textile Research, open conference on drying of textiles, Hotel Pennsylvania, New York, May 6, 1936.

Cotton Manufacturers Association of Georgia, Hotel General Oglethorpe, Savannah, Ga., May 21 and 22, 1936.

National Cotton Week, June 1 to 6, 1936.

American Association of Textile Chemists & Colorists, annual meeting, Providence, R. I., Dec. 4 and 5, 1936.

T. M. Russell, Jr., has been elected vice-president of Russell Mfg. Co., Middletown, Conn.

F. H. Chamberlain, Jr., and **Katherine Chamberlain** were elected president and treasurer, and vice-president and secretary, respectively, of the newly organized Lincoln Knitting Mills.

Max R. Cramer, treasurer and plant manager of United Textile Print Works, Long Island City, N. Y., has resigned.

Granville Strange has been elected president and treasurer of Hill & Cutler Co., cotton waste manufacturers, New Bedford, Mass., succeeding the late Laurance D. Chapman.

Wm. J. Erwin has just been elected vice-president of Republic Cotton Mills, Great Falls, S. C. He was formerly general superintendent.

W. M. Thompson has been made superintendent of Mace Mfg. Co., Randleman, N. C., succeeding **Thurston Engstrom** who has accepted a position in Argentina.

R. B. Timberlake has been appointed general superintendent of the American Textile Woolen Co., Sweetwater, Tenn., succeeding **W. H. Eyer,** who resigned to go into business for himself.

John A. Cromer, Lincolnton, N. C., who, with associates, recently purchased the Neely Cotton Mills, York, S. C., has gone to York to take over his duties as general manager of the mills.

William Midgley has been moved from the Shawsheen (Mass.) Mills of American Woolen Co. to become superintendent of the National and Providence (R. I.) Mills, succeeding **George Haigh,** who was moved to Puritan Mills, Plymouth, Mass., as resident manager.

E. W. Waller is shown above with a few of the candles at his fourteenth birthday party. He has reached the mature age of 60 but runs light on birthdays because born on Feb. 29, in a leap-year of course. He is treasurer and manager of the Philadelphia (Tenn.) Hosiery Mills which he founded in 1921 and which has grown from 30 machines on infants' hosiery to 280. He was with Charles H. Bacon Co. hosiery plants for many years previously. Mr. Waller oversees the practical operation of the plant himself, employing no foremen. He takes great interest in the welfare of his local community. His birthday party was a huge success.

Dr. R. E. Rupp has been made superintendent of dyeing, bleaching, printing, and all finishing at the Lyman, S. C., plant of Pacific Mills.

O. Windhagen, textile superintendent of the American Enka Corp., Enka, N. C., has resigned and will return to Europe about May 15. Mr. Windhagen came to Enka, N. C., in 1929 after extended services with German firms.

J. Frank O'Keefe has resigned as Chicago office manager of Berkshire Knitting Mills, Reading, Pa.

Charles Lee has been appointed superintendent of Elliot Mfg. Co., Manchester, N. H.

W. F. Patrick, superintendent of Welwood Silk Throwing Mills, McMinnville, Tenn., has tendered his resignation. It is understood he will join the Bedford (Va.) Weaving Co.

Fred Rosskopf has been appointed superintendent of the Altoona, Pa., mill of Schwarzenbach Huber Co., New York. He succeeds the late Charles Steiner, who died a month ago.

Frank Skidmore has completed 45 years of service with Joshua L. Baily & Co., New York.

W. M. Ratcliff, Sr., has been elected president and manager of the Guadalupe Cotton Mills, Cuero, Tex. Other officers elected were: **W. M. Ratcliff, Jr.,** and **T. O. Buchel,** vice-presidents; **R. B. McMahon,** assistant manager.

L. S. Lee, secretary of Bruck Silk Mills, Ltd., Cowansville, Que., has just been appointed vice-president and general manager of the company. Succeeding him as secretary of the company is **H. Stean.**

Sam Black has become president of the newly organized Black Hosiery Mill, Midland, N. C. He was formerly night superintendent of the Hoover Hosiery Mill, Concord, N. C.

Bradley Dearington has been elected president of the new Porter-Dearington Textiles, Inc., Putnam, Conn. **Paul A. Porter** is treasurer, and **Alyse D. Porter,** secretary.

Obituary

Bachrach

H. B. Swinglehurst

Ezra Dixon

Harry B. Swinglehurst, aged 68, president of Scott & Williams, Inc., New York, died of a heart attack at the Parker House, Boston, on March 14. Mr. Swinglehurst was born in England and came to this country at the age of four. When fourteen, he joined Scott & Williams in Philadelphia as an apprentice and soon became an expert draftsman, machinist, and knitter. In 1890 he became traveling engineer for the company, in charge of erecting machinery and solving knitting problems. In 1909 Mr. Swinglehurst moved to Boston to join the engineering and inventive department, in 1912 he went to Laconia, N. H., as general superintendent, in 1917 he was made general manager with headquarters in New York, and in 1925 he was elected president. More than 50 patents were granted to him. His home was in Orange, N. J.

Ezra Dixon, aged 86, founder of Dixon Lubricating Saddle Co., Bristol, R. I., died at his home there March 22. He started work in a mill in Quardick, Conn., at the age of nine, and at thirteen enlisted in the Union Army. After working in a number of mills after the war, Mr. Dixon joined the Namquit Mills, Bristol, in 1874, where he invented the lubricating saddle, and in 1886 he left to devote his full time to the manufacture of his invention. He was a member of the House of Representatives in 1907 and served in the State Senate from 1909 to 1916. While the two were alive, Mr. Dixon and the late Antonio Spencer were inseparable companions and a feature at every gathering.

R. B. Davenport, aged 78, founder and president of Davenport Hosiery Co., Chattanooga, Tenn., until his retirement, died on March 28.

Alton W. Arnall, aged 56, president and treasurer of Arnco Mills, Newnan, Ga., and Arnco Mfg. Co., Elberton, Ga., died March 15.

Charles B. Warren, aged 62, president of William Warren Thread Works, Westfield, Mass., died at his home in that place on March 1.

Chas. G. Phillips, aged 76, former president United Publishers Corp., which controls 24 trade journals, including *Dry Goods Economist,* died March 30, at Upper Montclair, N. J.

J. Smith Campbell, aged 54, president Campbell Mfg. Co., Maiden, N. C., yarns, died recently.

Frederick Le Glaize, aged 60, vice-president, Virginia Woolen Co., Winchester, Va., died recently.

John Secor, aged 83, for 25 years superintendent Winsted (Conn.) Hosiery Co., died recently.

Chas. S. Lockwood, aged 86, technical associate of John Wesley Hyatt, inventor of the Hyatt roller bearing, died March 20 in Newark, N. J.

Geo. Van Keuren, aged 74, vice-president and treasurer of Bellman Brook Bleachery Co., of Fairview, N. J., died March 30.

John Barnes, president Blood Knitting Co., Amsterdam, N. Y., died April 2.

Adolf Kuttroff, aged 89, a director of General Dyestuff Corp. and formerly chairman of the board, died in March. He founded firm of Pickhardt & Kuttroff (later Kuttroff, Pickhardt & Co.).

Dr. George A. Prochazka, aged 80, long identified with the dyestuff industry and one of the founders of Central Dyestuff & Chemical Co., Newark, N. J., died in East Orange, March 24.

William Elliott White, aged 58, secretary-treasurer for 35 years of Travora Mfg. Co., Graham and Haw River, N. C., died at home last month.

Morris R. Poucher, aged 77, president National Fuels Corp., New York, died suddenly in late February. He was prominent in development of the American dye industry after the war.

John W. Paris, secretary and treasurer of Prairie du Chien (Wis.) Woolen Mill and connected with the concern for 45 years, died at his home there recently.

William A. Hamann, aged 75, formerly president and chairman of the board of Roessler & Hasslacher Chemical Co., died on March 24.

Business News

Atkinson, Haserick & Co., Boston, having had the opportunity of securing the agency of outstanding manufacturers of Continental card clothing, resigned some weeks ago all other agencies for these goods. They are now in a position to handle cotton as well as woolen and worsted card clothing in the United States and Canada.

Terrell Machine Co., Charlotte, N. C., mailed copies of the booklet "There is One Way Out," by Lewis W. Douglas, former director of the budget, to the mailing list of the *Termaco Times*.

Warwick Chemical Co., West Warwick, R. I., have engaged M. M. McCann to take charge of their technical service. Mr. McCann was formerly supervisor of research and manager of dyeing and finishing for Burlington Mills.

Robert & Co., Atlanta, Ga., are not planning to open New York and Washington offices as recently rumored, according to J. M. Shelton, vice-president.

Bahan Textile Machinery Co., Greenville, S. C., has developed a loom attachment which it is said will make old (160 picks or less) looms operate smoothly at 190 to 200 picks per minute. Several looms equipped with this device are on display at the Bahan plant running at 200 picks.

Permutit Co., New York, announces that J. D. Yoder, formerly vice-president and general manager of the Cochrane Corp., Philadelphia, Pa., has joined the company in a sales executive position. Mr. Yoder has been interested in the development of hot process treatment of boiler feedwater, and will continue this interest through Permutit's facilities for conditioning boiler feedwater.

Charles W. Metcalf, formerly with the Cotton-Textile Institute, has been appointed southern representative for the **Textile Banking Co.,** of New York, and will have offices in Charlotte, N. C. He succeeds **Taylor R. Dunham,** secretary of the Southern Hosiery Manufacturers Association, who recently resigned to take a position with the newly organized **John P. Maguire Co.**

Alma D. Telzerow and **Charles Arnold** have opened a textile design studio at 377 Broadway, New York, as firm of Telzerow & Arnold. Mrs. Telzerow has been associated with the cotton textile market for seven years. Her late husband was a member of the old firm of Telzerow & Sheft. Mr. Arnold has been connected with the design business for a number of years developing ideas for both the cotton and silk trades.

James Talcott, Inc., factors, New York, report for 1935 a record volume of business totaling $68,162,010 and a net profit for the year of $481,952. This compares with a net profit of $339,880 for 1934. The firm has entered into an arrangement with the Scottish-American Co., Chicago, to act as factoring correspondent in that city.

Bentley Engineering Co., Ltd., Leicester, England, represented in this country by Scott & Williams, Inc., New York, has purchased T. Grieve & Co., Ltd.

Wildt & Co., Ltd., Leicester, England, has purchased the hosiery-machine building business of William Spiers, Ltd., represented in this country by Fidelity Machine Co., Philadelphia.

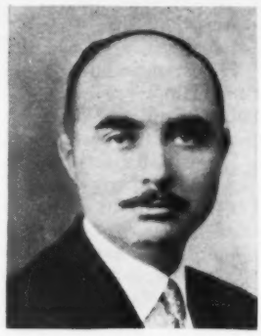
Stein Equipment Corp., 426 Broome St., New York, has been organized by Jerome D. Stein, formerly secretary-treasurer of the Stein-Brill Corp. The company will carry rebuilt equipment for the chemical, paint, soap, sugar, oil and allied industries.

H. & B. American Machine Co., Pawtucket, R. I., has appointed William McL. Fraser as assistant general manager.

Textile Banking Co., New York, has announced the following appointments: southern representative, Charles W. Metcalf, with headquarters in Charlotte, N. C.; New England representative, Edmund H. Leland; new business department, Walter H. Weber, with headquarters in New York.

Paper Box Supply & Equipment Exposition will be held at the Traymore Hotel, Atlantic City, N. J., May 16 to 20, 1936.

Charles Cooper & Co., Bennington, Vt., common stock has been acquired by William T. Barratt and John F. Hayes from the estate of the late Elizabeth Cooper Kelley, daughter of the founder. Mr. Barratt will serve as president and Mr. Hayes as vice-president. Both have been with the company for over 40 years.



Irving J. Saxl who has joined E. F. Houghton & Co.

New Publications

The Townsend Scheme; National Industrial Conference Board, Inc., New York; $1.00.

The Townsend plan, states the foreword to this book, is one of a large number of schemes for creating prosperity and guaranteeing economic security that have been produced "by the impact of the depression upon the economic ignorance and illiteracy of the general public." The report describes as simply as possible how the advocates of the Townsend plan expect it to operate—and how it would actually operate if it were put into effect. It is an important factual contribution to the literature on a subject which should have airing.

What Employers Are Doing for Employees; National Industrial Conference Board, New York; $2.00.

This is a statistical survey of voluntary activities undertaken by American business for the improvement of working conditions and employer-employee relations. It is based on information supplied by 2,452 establishments employing 4,502,608 persons. The study is broken down into these types of industrial relations programs: Collective Bargaining; Improving the Employee's Economic Status; Employee Self-Improvement; Employee Physical Welfare; Employee Privileges; Employment Technique.

Phi Psi Elects Officers

Phi Psi, national textile fraternity, held its annual convention late last month at Charlotte, N. C., and elected the following officers: H. Cochrane, Fitchburg, Mass., president, A. K. Haynes, Atlanta, Ga., vice-president, Ted Thomas, Bennington, Vt., secretary, and John E. Fite, Jr., Philadelphia, treasurer. The retiring president was John H. Grady of Boston.

Speakers included Carl R. Harris, manufacturing engineer, Erwin Cotton Mills Co., Durham, N. C., F. Gordon Cobb, Pomona Mfg. Co., Greensboro, N. C., Dr. Thomas Nelson, dean of North Carolina State College Textile School, Elmer C. Bertolet, of Philadelphia Textile School.

Members of various committees on arrangements included W. A. Kennedy, Arthur R. Thompson, T. W. Church, J. V. Killheffer, F. W. Warrington, and P. H. Delplain. Ed Hadley is president of the Charlotte chapter.

Phi Psi officers: left to right (standing) A. K. Haynes, vice-president; Ted Thomas, secretary; John E. Fite, Jr., treasurer; (seated), H. Cochrane, president; J. H. Grady, retiring president.

Boger & Crawford Enlarge

Boger & Crawford, Philadelphia, will erect an additional mill building at their plant in Lincolnton, N. C., and install 12,000 additional new spindles. Structure will be steel and brick, three-stories, 400x110 ft., so designed to permit lengthening to 620 ft. at a later time. It will be known as Mill No. 4. Contract for the spinning has been given to Whitin Machine Works. This is said to be the first combed peeler yarn mill to be erected for eight years.

Meetings of Textile Associates Club

The Textile Associates Club met in New Bedford on Mar. 14 for their monthly luncheon. Peter Warburton of the Amoskeag Mfg. Co. spoke on physical preparedness of textile plants to meet competition successfully. The club also met on Apr. 11 at the Putnam Inn, Putnam, Conn., when J. Mellor gave a talk on weaving.

Report on Flax Available

The Textile Foundation has published a report on flax, covering experimental studies in growing, decorticating, chemical degumming, and manufacturing into yarns and fabrics. These studies were conducted by a committee appointed as a result of the widespread interest in this subject. Copies of the report may be secured by addressing the Textile Foundation at Commerce Building, Washington, D. C.

TEXTILE WORLD ANALYST

Lull in most textile markets thought to be temporary

Textile Mill Activity Up: Textile mill activity during the first two months of 1936 was approximately 9% over the corresponding period of 1935. The increase did not apply to all fibers, however; cotton and wool were up, silk was off, and rayon was about the same. With official March statistics not available at this writing, it is impossible to state definitely just how much the effects of the flood were felt in production, but the best opinion is that restriction from this source was limited.

WE ARE forced to borrow a term from the professional market-writer this month. In his not-too-exciting jargon, the textile industries "marked time" last month. Uncertainty as to ultimate tax legislation and restrictive effect of the floods were the principal reasons. Demand was not spirited in most branches of the industry.

Prices drifted during March and there were no marked changes in TEXTILE WORLD's price index numbers. Raw cotton did not shift sufficiently to affect the index number, but yarns and cloth sagged slightly. Although the raw wool index was up one point because of high prices the early part of the month, prices weakened the last week of March and the upward trend was broken for the first time since April, 1935.

Meanwhile, increasing evidence of continued improvement in general business laid the basis for confidence in this industry specifically. In fact, there is a belief in some quarters that another spurt is just ahead in textiles, with the possible exception of wool goods.

Highlights in the several branches are summarized below:

Cotton: The most discouraging feature of this division of the industry was the contraction of manufacturing margins, which of course represent profit possibilities. It will be noted from Table I that margins on carded cotton fabrics went from an average of 16.5c. in February to 15.5c. in March, or nearly down to the low of last July. Carded yarn margins, as shown in Table II, also took a tumble—from 17.5c. in February to 16.3c. in March—but are relatively better than the fabric margins. . . . Among the more encouraging factors was the allotment of $1,300,000 by the Government for development of cotton roads.

Wool Goods: March registered a lull in wool goods. Position of mills as regards forward commitments was reported as very irregular, some being sold up for three months or more, and others needing new business within a few weeks. Despite the inactivity, there seems no reason to doubt the firm position of the market. Woolens and worsteds were not advanced to parity with the high point touched by tops in February, and consequently fabric sellers have confidence in their prices under present conditions.

Rayon: Rayon yarn situation has been generally good. The 100/60 has been selling actively due to taffeta demand, and stocks are smaller because of the effects of the flood. Yarn prices generally are steady to strong.

Silk: Raw material showed surprising pep last month, the prices increasing in the face of sluggish demand. Hosiery mills are due to buy soon, it is felt, as their raw stocks are low. The woven market is even more completely out as an outlet for silk.

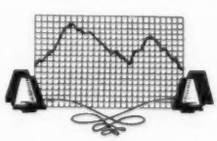
Knit Goods: The hosiery market was featured by uncertainty, due to problem of the maintenance of the work-week in the South, but this was regarded as temporary. . . . Helped by favorable weather, this winter has been a good one for heavyweight knitters. Considerable summer business is also being placed, one interesting phase being a revival of the supporter shorts which had a sensational though brief run last summer. . . . In outerwear, swimsuits and summer sweaters are in active demand, and some leading manufacturers report that swimsuits sales are 15 to 25% ahead of this time last season.

TABLE I. CARDED FABRIC MARGIN

Date	Margin in cents	Date	Margin in cents
August, 1933....	21.4	June, 1935.....	16.5
October, 1933...	19.1	July, 1935.....	15.2
January, 1934...	18.4	August, 1935...	17.1
April, 1934.....	17.6	September, 1935	17.9
July, 1934.....	15.5	October, 1935...	17.7
August, 1934....	16.6	November, 1935	16.4
September, 1934.	18.6	December, 1935	16.2
October, 1934...	17.4	January, 1936...	17.2
November, 1934.	15.8	February, 1936..	16.5
December, 1934.	16.2	March, 1936....	15.5
January, 1935...	16.2	Mar. 4....	16.0
February, 1935..	16.0	Mar. 11....	15.6
March, 1935....	15.9	Mar. 18....	15.6
April, 1935.....	16.1	Mar. 25....	15.3
May, 1935.....	16.0	Apr. 1....	15.2

TABLE II. CARDED YARN MARGIN

Date	Margin in cents	Date	Margin in cents
August, 1933.....	23.5	June, 1935.....	14.5
October, 1933...	20.0	July, 1935.....	14.3
January, 1934...	18.3	August, 1935...	15.3
April, 1934.....	15.9	September, 1935	15.4
July, 1934.....	14.7	October, 1935...	15.8
August, 1934....	15.3	November, 1935	16.3
September, 1934.	15.6	December, 1935	16.3
October, 1934...	14.6	January, 1936...	18.4
November, 1934.	13.5	February, 1936..	17.5
December, 1934.	13.5	March, 1936....	16.3
January, 1935...	13.5	Mar. 4....	17.0
February, 1935..	13.9	Mar. 11....	16.2
March, 1935....	14.4	Mar. 18....	16.2
April, 1935.....	14.1	Mar. 25....	16.2
May, 1935.....	13.8	Apr. 1....	16.1



Textile World's Price Index Numbers

STARTING with January, 1936, TEXTILE WORLD has revised its price index numbers to a 1923-25 base, to correspond with current statistical practices. Those who wish to continue with indices based on July 1, 1914, for chart purposes or otherwise, can secure conversion factors to change the new figures to the old by writing TEXTILE WORLD, Statistical Dept., 1427 Statler Bldg., Boston, Mass. Figures on cotton manufactures, Aug. 1, 1933 to Jan. 6, 1936 include processing tax.

Date	Cotton Index Numbers: Cotton	Yarns	Gray	Colored	Wool Index Numbers: Wool	Tops	Yarns	Cloth	Silk Index: Raw Silk
1923-25 average	100	100	100	100	100	100	100	100	100
1930 average...	50	61	61	72	58	61	72	90	109
1931 average...	32	58	46	59	46	49	59	71	32
1932 average...	24	37	37	60	36	40	52	57	21
1933 average...	39	56	55	50	53	59	62	80	21
1934 average...	61	67	70	62	63	70	75	91	17
1935 average...	60	68	67	69	56	58	70	88	22
July 1935.....	61	68	65	69	56	59	70	89	20
Aug. 1935.....	58	68	66	69	56	59	70	89	23
Sept. 1935.....	55	66	68	69	58	60	70	89	25
Oct. 1935.....	57	68	68	69	60	61	73	92	27
Nov. 1935.....	60	70	69	72	62	65	75	92	27
Dec. 1935.....	60	71	69	72	64	66	76	92	26
Jan. 1936.....	48	67	63	68	67	73	75	93	26
Feb. 1936.....	42	62	58	67	72	81	77	93	24
Mar. 1936.....	42	61	57	66	73	81	77	93	23

TEXTILE WORLD'S

Cotton Digest

THE average business-man is not generally articulate. Often he feels the urge to speak his piece in public, but his resistance to that urge is apt to be high. Textile manufacturers are no exception to this rule.

Sometimes this is just too bad—particularly when an industry is up against a group of expert publicists. Take AAA as an example.

Leavelle McCampbell refused to take it any longer. In an unanswerable answer to statements previously made by Secretary Wallace, he proved that instead of receiving "an outright gift of money" in connection with impounded and unpaid processing taxes, as the Secretary had claimed, the manufacturers are still heavy losers.

At the conclusion of his excellent brief, Mr. McCampbell has this to say:

"It has not been my purpose to rehearse the wrongs of the cotton textile industry but I cannot sit idly by, while my industry is vilified and 'beaten over the head with a soot-bag' by the very perpetrators of these wrongs. This method of defending unwarranted official conduct was strongly recommended by Machiavelli; but today abuse, as a substitute for logic and justice, is a little out of date."

That is an eloquent conclusion to a fine piece of public service. This willingness to "stick one's neck out" deserves emulation by other manufacturers.—*Editor.*

F.T.C. Report Shows Textile Losses

Cotton weavers and commission dyeing and finishing companies showed profits during the first half of 1935, while cotton spinners, combined weaving and spinning plants, and stock dyeing and finishing firms showed losses, according to a report made last month by the Federal Trade Commission. The report, covering activities of 582 cotton textile companies, showed a net profit of 0.48% for 72 weaving companies, a net profit of 1.56% for 84 commission dyeing and finishing companies, a net loss of 2.78% for 113 spinners, a net loss of 3.90% for 303 combined spinning and weaving companies, and a net loss of 0.84% for 11 stock dyeing and finishing companies.

In second half of 1935 (report released on Apr. 10), 44 spinning mills showed a profit of 1.21%; 35 weaving mills, a profit of 3.87% 119 combined spinning and weaving mills, a profit of 0.12%; 42 commission weavers and dyers, a profit of 1.18%.

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$1,300,000 Allotted "Cotton Road" Program

An allotment of $1,300,000 has been made by the Department of Agriculture to stimulate field tests on the use of cotton and cotton fabric in highway construction. The project will make available cotton fabric for a maximum of 1,000 miles of bituminous-surfaced road and for approximately 80,000 mats for curing concrete construction. The Cotton Textile Institute envisions absorption of 10,000,000 sq.yd. of fabric, equivalent to 8,000 to 10,00 bales of raw cotton, and 80,000 to 90,000 curing mats, 6x22 ft., containing about 8 oz. cotton per sq.yd. About 2,500,000 yd. 7 oz. osnaburg are expected to go into the construction of these mats. The potential market for reinforcing fabrics is indicated in the annual construction of 20,000 to 30,000 miles bituminous surfaced roads.

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S.T.A. Forms Tenn. Chapter—Other Meetings

The Tennessee Division of the Southern Textile Association was organized March 28 at Knoxville, Tenn. A large number of operating executives attended, and the following officers were elected: B. W. Bingham, overseer carding, Brookside Mills, permanent chairman; R. T. McWade, superintendent, Brookside Mills, temporary vice-chairman; G. R. Goodwin, overseer spinning, Brookside Mills, secretary. The first regular meeting is planned for May 16 at Knoxville.

The South Carolina Spinners Division is scheduled to meet April 18 at Spartanburg, S. C. Details of the meeting will be published in the May issue.

The Northern North Carolina-Virginia Division met April 11 at Greensboro, N. C. Details of the meeting will be published in the May issue.

The Eastern Carolina Division is scheduled to meet April 23 at Raleigh, N. C., in conjunction with the annual State College Style Show.

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Pelzer Changes Hands

The Pelzer (S. C.) Mills of the Pelzer Mfg. Co. have been sold, according to announcement on Apr. 10 by F. L. Higginson, chairman of the voting trustees. The purchasers are J. P. Stockton and southern associates. Mr. Stockton is head of the Stockton Commission Co., New York. E. F. Woodside may become general manager of Pelzer. In the transaction Edwin Farnham Greene, of Enderley Corp., acted for the purchasers, and Henry G. Lord acted for the Pelzer interests. The mill operates 310 cards, 136,356 spindles, and 2,497 looms on sheetings, shirtings, drills, etc. It has had a long and famous history. The Tucapau Mills of the Pelzer Mfg. Co. were recently sold to the Spartan Mills.

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Markets Uninteresting

The cotton cloth market opened slow due to legislative uncertainty, and continued in that vein most of the month. There were some early drops in price of $\frac{1}{8}$ to $\frac{1}{16}$c. reported, but a slight spurt in volume later relieved this situation to some extent. The month closed with prices fairly steady.

Preliminary reports for the month indicated that carded and combed peeler yarn would make a somewhat better showing than for the previous month, but general trading was poorer.

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February Statistics

Key cotton prices of April 1 and a month ago, contrasted with those of the last two years follow:

	Apr. 1 1936	Mar. 2 1936	Apr. 2 1935	Apr. 2 1934
Spot Cotton N. Y..	11.56	11.28c	11.30	12.15
Ditto, high previous month....	11.72	11.80c	12.60	12.50
Ditto, low previous month....	11.20	11.25c	10.65	12.00
10s hosiery cones...	23½	24c	26½	29c
10s/2 carded skeins.	23½	24c	26½	29c
20s/2 carded peeler warps.....	26½	27c	29½	32½c
60s/2 combed peeler warps.....	53½	54c	56	59½c
60s/2 mercerized cones.....	68c	68c	70	73c
37 in., 3-yd. drill....	8½	8½c	9½	9½c
38½-in. 64x60s.....	5½	5 7/16c	6½	6½c
36-in. 4-yd. 56x60s...	7	7½c	7½	8c
Denim, 2.20s.....	13	14c	13½	16c

Statistics of particular interest to cotton manufacturers showing February operations and the raw material situation:

Spindle activity.....105.2% capacity, or 6,736,374,454 spindle hours
Cotton consumed ..... 516,649 bales
Cotton exported ..... 406,022 bales
Cotton imported ..... 17,837 bales

January operations for comparison:

Spindle activity .....111.9% capacity, or 7,713,696,496 spindle hours
Cotton consumed ..... 591,309 bales
Cotton exported ..... 525,636 bales
Cotton imported ..... 13,547 bales

A. C. M. A. Program

"Who Will Pay the Bill?" will be the subject of an address by Dr. E. W. Kemmerer, Professor of Economics at Princeton, at the annual convention of the American Cotton Manufacturers Association at Pinehurst May 1 and 2. Dr. C. T. Murchison, president of The Cotton-Textile Institute, will be another of the principal speakers. The keynote of the meeting will be "The Social and Economic Value of the Cotton Textile Industry to the South."

A round-table discussion of "The Problems Common to the Cotton Farmer and the Cotton Manufacturer" will be conducted by Donald Comer, president of Avondale Mills, and first vice-president of the Association.

Others scheduled to speak include: Robert R. West, president of Riverside & Dan River Cotton Mills; David R. Coker of Hartsville, S. C.; and Dr. J. W. Harrelson, president of State A. & E. College, Raleigh, N. C.

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Amoskeag Meets Apr. 15

Common stockholders of Amoskeag Mfg. Co., Manchester, N. H., at a meeting there April 3 voted to withhold action on the 77B reorganization plan until more details of the proposal were available. The session was adjourned until April 15. Motion to defer action was made by Lawrence A. Harrington, of Nashua, N. H., who holds a substantial parcel of stock. He based his opposition to immediate action on the point that stockholders should not vote until informed what they were voting on; Frederic C. Dumaine, treasurer, approved the suggestion to adjourn the session.

The company's annual report for 1935 up to Dec. 24, made public at the same time, showed a net loss of $1,111,989 against a loss for the full year preceeding of $1,008,458. The 1935 sales totaled $13,880,421 against $17,096,194 in the year previous. The company's mills have been closed since last September.

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Industry Notes

Nashua Mfg. Co. has retained **Barnes Textile Associates,** consulting engineers, Boston, Mass., to assist in putting into effect changes in its manufacturing and merchandising program.

Temporary Third Shift Discontinued —The temporary third shift of Pacific Mills' looms was discontinued on March 1. This shift was run to compensate for the loss of production while a number of looms from the American Printing Company were being installed. The new looms are now running and the mills are back on their regular basis of operation.

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Klumpp, Glynn New Yarn Firm

Joseph J. Klumpp and Martin P. Glynn, Jr., have established Klumpp, Glynn & Co., cotton yarn selling agents, with offices at 1700 Walnut Street, Philadelphia. Mr. Klumpp was for 25 years in the yarn division of Cannon Mills, and Mr. Glynn has also been in the yarn business for a quarter of a century, much of it with Cannon. Both men, in conjunction with a market research company, have been making a seven-year study of uses and applications of yarn. The company represents a group of northern and southern mills.

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Cotton Mill News

Opelika Mills, Opelika, Ala., after having been idle for some time, is being revamped and started up.

Pepperell Mfg. Co., Unit No. 1, Lindale, Ga., has completed installation of 123 latest-type Saco-Lowell long-draft spinning frames. Work was under the direction of F. M. Willis.

Anchor Duck Mills, Rome, Ga., is spending $8,000 in construction of a cloth storage room. C. M. Guest & Son are the contractors. Previous report on extending slasher room is incorrect.

C. A. Butterworth, formerly engaged in cotton manufacture at McComb, Miss., is establishing a tape, rope and mop plant at Summit, Miss.

Johnston Mfg. Co., Charlotte, N. C., has begun one-story addition, 100x163 ft., for which general contract was let to Fiske-Carter Construction Co., Greenville, S. C. It will cost about $50,000.

Erwin Cotton Mills Co., Durham, N. C., has purchased a Guillet overhauling system for its Cooleemee plant. This system, sold by Dixie Spindle & Flyer Co., Charlotte, N. C., is the third purchased by the Erwin Company.

China Grove (N. C) **Cotton Mills Co.** has plans under way for extensions and improvements in plant of Southern Mercerizing Co., Tryon, N. C., including remodel of existing buildings and installation of additional equipment. It is proposed to triple former output. Cost estimated close to $100,000.

Borden Mfg. Co., Goldsboro, N. C., began installation of new machinery, improvements and rearrangements on March 12, including erection of a bridge connecting two buildings on opposite sides of North William Street. The project will cost over $50,000.

Springs Cotton Mills, Lancaster, S. C., is installing machinery in the large addition recently completed which will be ready for operation about May 1. Installed in the addition will be 1,200 looms, bringing total to 6,000.

Crompton-Shenandoah Co., Waynesboro, Va., is completing work on new mill unit, comprising former local building of General Electric Co., recently taken over for expansion. New unit will represent an investment of about $35,000.

COTTON IN THIS ISSUE

	page
Cotton Typp Recognized at D-13 Meeting	85
Analysis of Fabrics Shown at N. C. Textile School	88
Fugitive Tints Now Aid Knitter and Weaver	109
Filling from Doff Box Emptied Mechanically	118
Regarding the Loomfixer	119
Design for Shirting	120
Uneven Picker Laps	121
How Georgians Spin and Card	122
Staple Cotton Fabrics	124
Lickerin Damage Minimized by Speeds and Settings	125

Cotton Financial Notes

Net profit and net loss as shown by a number of representative cotton manufacturers for 1935 and 1934 follow:

	1935	1934
Cannon Mills	$3,271,588	$2,570,382
Brighton Mills	38,868*	10,851*
Kendall Co.	285,585	515,967
Montreal Cottons	244,987	1,138
Mt. Vernon Woodberry Mills	174,012	413,990
United Elastic Corp.	82,423	17,884*
Merrimack Mfg. Co.	512,658*	127,103
Nashawena Mills	339,657*	523,263*
Raybestos-Manhattan Co.	1,374,423	750,891

*Indicates net loss

American Thread Company will close the Stonington, Conn., plant, according to a recent decision of directors. Some 300 employes who would be thrown out of work, have offered to work an extra hour daily without pay if the decision is rescinded.

Semple Mfg. Co., Louisville, Ky., mops and twines, will reorganize under the bankruptcy law.

Nashua (N. H.) **Mfg. Co.** is planning to close its Suffolk Mills, Lowell, Mass., for an indefinite period, and will transfer operations to mills at Nashua.

Consolidated Textile Corp., New York, N. Y., is considering resumption of operations at branch mill at Pelham, Ga., idle for about four years.

Burke Cordage Co., Icard, N. C., has been incorporated by C. A. Spencer, J. I. Morgan, and John Yancey. The new company has purchased the old Icard Cordage Co. from the receivers.

Caswell Mills, Inc., Kinston, N. C., will be sold at public auction April 27. The trustees were unable to work out a plan to finance a test run of 60 days, it is reported.

National Cotton Mills, Inc., Lumberton, N. C., was scheduled for sale at public auction April 8. The mill contains 15,360 H. & B. spindles, a raw-stock dyeing department, and is equipped to manufacture carded, single, colored yarns to 30s.

Mebane (N. C.) **Yarn Mills, Inc.,** have been incorporated by W. S. Coulter, L. C. Allen, and Eva Burke Clapp, of Burlington, N. C.

Tucapau (S. C.) **Mills** have been sold by the Pelzer Mfg. Co. to the Spartan Mills, of Spartanburg, of which Walter S. Montgomery is president. The transfer of the property will take place in May and until that time the Pelzer Mfg. Co. will operate and carry on the business. The mills manufacture print cloths and crash towelings, the latter being marketed under the name of "Startex," and that is the name that the Tucapau Mills will probably use in the future.

Neely Cotton Mills, York, S. C., capitalized at $25,000, have been chartered to engage in the textile business. Officers: James C. Cloniger, president and plant manager; John A. Cromer, treasurer.

Walcott & Campbell Co., Gulfport, Miss., will be in foreclosure proceedings as result of court action following application of the owner of a $234,000 mortgage on the property. It is said that a group is being formed to buy the plant and convert it into a silk and rayon mill.

Lawton Spinning Co., Woonsocket, R. I. —The two local mills and machinery of this company were offered at public auction on April 15. William O. Todd and Frederick S. Peck are liquidating agents, in charge.

TEXTILE WORLD'S

Wool Digest

SOME of our friends in the wool manufacturing business seem to be getting the jitters. The present lull in demand has imbued them with fears for the future of the market. Some of them even hint at calamity ahead.

All of which is very, very silly. In the first place, every student of the market—and he didn't have to be very studious at that—has known and said that the 1935 level of activity could not be maintained indefinitely. In the second place, there is nothing in the picture at present that foreshadows collapse.

On the contrary, general business entered the second quarter in an unusually strong position; bonus payments starting in June are sure to stimulate purchase of consumer goods; the raw material position in wool manufacture is statistically sound.

Even if there is a prospect of somewhat reduced business in wool goods in 1936 from 1935, that is no reason for fright. Look at the activity curve of past years; it has been up and down, with the ups and downs alternating pretty much by years.

It seems difficult for manufacturers to get used to the process of history repeating itself.—*Editor.*

A Paradoxical Market Follows Flood

A paradoxical market has followed the New England floods which wrought perhaps $3,000,000 damage to the wool good industry and set back worsted production from one to three weeks. Despite the absence of expected fabric production in March and April which makes for a spot scarcity, and despite widespread flood damage to homes and stores not only in New England but also in New York, Pennsylvania and West Virginia which induces a large replacement market for numerous wool products—buyers have been hanging back and a definite market lull has been in evidence.

Fundamentally there is no change to shake confidence in the future. Spot domestic wools are scarce, the new clip is still several weeks from market, foreign wool centers are strong and rising. Clothing markets have been active, there is no burdensome carryover, and the forthcoming flow of bonus cash must certainly stimulate all lines of consumer goods.

The Easter season is regarded as a potential success, though when this was written full reports were not available. Cloak and suit houses are understood to be falling far short of delivering all the Easter apparel ordered so that retailers are in little danger of having excessive stocks. In general the women's wear market has shown encouraging tone with more interest in white and pastel coatings for mid-summer. Several mills took quiet business in fleece coatings for fall at $1.20 to $1.25 around mid-March.

Men's wear gains added strength from the fact that a large part of the future business on the books is at lower than current prices, a matter which should make the orders attractive to hold and which renders a small decline at first hands (if continued quiet finally brings that about) fairly harmless so far as clothiers' plans for the season are concerned. As a matter of fact prices have reached a point where popular price garment ranges must be advanced or cheaper goods substituted. The market has been feeling this call for substitutes in worsteds at less than $2.00, as most half-blood worsteds are at $2.17½ and up.

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American's Annual Meeting Adjourns at 4:15 A.M.

Protracted and acrimonious was the annual meeting of the American Woolen Co. at Springfield, Mass., last month. It began on Mar. 24 with a series of postponements while tellers and four adding machine operators worked until midnight to tabulate the 25,000 proxies representing approximately 400,000 shares. It ended at 4:15 a.m. on Mar. 27 with reelection of present officers. Unusual interest had been aroused in the meeting by activity of minority stockholders who were seeking to elect their three representatives to the board to replace the three directors who came up for reelection. The minority has for several years attacked the management on the qualifications of its personnel and on the propriety of its acts.

After the counting of the proxies, the meeting went into session in earnest at 10:30 p.m., March 26. The minority had many questions to put to the management but James A. Donovan who was in the chair ruled that all questions would be recorded and answers given in writing at a later date since questions not presented prior to the meeting or included in the call could not be properly answered. Questioning then continued till past midnight and to within a few hours of breakfast the next day. When it ceased the management reelected its slate with a vote of 316,085 for and 146,383 against. The minority group protested 154,236 management shares, and the management protested 12,060 shares of minority proxies. The meeting was colorful throughout with its constant exchange of wit, with one scuffle for which cops were called but did not come, and with one small fire due to a cigar butt on a chair seat.

The American Woolen Co. is informally reported to have made a profit of $800,000 for the first two months of 1936 against a loss of about the same amount in corresponding months of 1935. There was no official confirmation.

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Wool Price Trends and Activity

Key wool prices of April 1 and a month ago, contrasted with the last two years:

	Apr. 1 1936	Mar. 2 1936	—Apr.— 1935	1934
Fine and fine med. territory	$0.85	$0.88	$0.62	$0.81
Ohio 3/8s	.41	.43	.26½	.41½
Tops, fine 64-66s	1.12	1.18	.86	1.18
Average 3/8s	1.01	1.05	.72	1.06½
High 1/4	.94	.96	.59	.95½
Noils, fine	.70	.72	.52	.59
1/4	.55	.58	.40	.50
2-40s 60s wstd yarn	1.60	1.60	1.28½	1.65
8020 serge	1.95	1.95	Not	Quoted

Current statistics on wool consumption and mill activity follow, the activity percentage being based on single 40-hour shift, 5 days per week. January is based on five-weeks and February on four.

	January	February
Wool consumed, clean equiv.		
Apparel wool	28,225,000	24,488,000
Carpet wool	7,690,000	7,256,000
Machinery activity		
Looms (50" wider)	113.0%	111.0%
Carpet looms	58.1%	57.1%
Combs	133.1%	110.7%
Worsted spindles	77.1%	87.6%
Woolen spindles	121.9%	117.0%

This is the package for which a prize was awarded Botany Worsted Mills in the Irwin D. Wolf competition on Mar. 4 in New York. Entry was made by DuPont Cellophane Co. Botany was the only strictly textile firm to win an award in this packaging competition.

Tops Off 7c. per Lb. on Light Trading

Wool tops as quoted at spot by the exchange lost about 7c. per lb. during the month of March on light trading. The basis was $1.10 on Feb. 28 and $1.03 on Mar. 28, and $1.00½ on Apr. 3. Futures were down the same amount, being about 9c. under spots. Top futures in foreign markets were reported at about the best levels touched since 1934.

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Wool Market Goes to Sleep

Transactions in the Boston wool market during March were so limited that there was no real test of prices. Buyers simply were not interested even though supplies of greasy domestic wools are small. Prices were nominally unchanged, but there was an undercurrent which indicated a downward tendency. As most of the mills were forced to close for two weeks because of the flood, consumption figures will show a drop. Wool buyers are now visiting the West where prices on the new clip are said to be slightly easier than those paid on earlier contracts. London wool auctions which closed March 25 showed gains of par to 7½% over the last previous sales which closed Jan. 30. Tone of London market was described as "very good."

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Wool Industry Briefs

Unfilled orders for wool goods were estimated as about 40,000,000 yd. on Mar. 18 or equivalent to 11 weeks' work on basis of production rate current in early March.

Associated Wool Industries has distributed a 16-page "News Flash" giving concrete suggestions to retailers for displaying men's and women's apparel and illustrating and listing the spring offerings of leading cloak and suit houses.

C. M. Deland & Co. are offering fine camel hair overcoatings, 25 oz. at $4.12½.

Traders with foreign connections report an advance in English woolens and worsteds late in March of 10 to 40c. per yard.

Woolen Jobbers Association, New York, has been formed to improve relations between jobbers and mill agents. Kirschner & Adelman are the attorneys.

Frank J. Morrissey will open an office at 246 Summer St., Boston, to represent the knitting yarns of the Energetic Worsted Corp., Bridgeport, Pa.

Part-wool blankets have been withdrawn from the market by some sellers after a successful opening. An advance of about 5% is said to have been made on other lines. All-wool blankets have been advanced 10 to 20c.

Antique Indian fabric illustrated last month is to be found at the Museum of the American Indian, New York, and not at the "Boston Museum," as stated.

Parker Wilder Co. has opened women's plaid-back coatings at $1.47½ and fleeces at $1.17½.

American Woolen Co., Dept. 4, are showing their Anderson fleeces for women's wear at $1.25.

WOOL IN THIS ISSUE

	page
Wool Heads D-13 Meeting Program	85
Breaking Shed Often Advisable on Wool Looms	89
2c. per 1,000 Gallons is Mill's Cost to Purify Water	90
Improved Lighting Speeds Colored Yarn Production	112
Regard the Loomfixer	119
Frieze Is Blotchy	120
Spray Printing of Carpets	120
Dresser Reel	126
Dyeing Wool at Low Temperatures	140

Wool Mill News

Atlanta (Ga.) **Woolen Mills** have let general contract to Allied Construction Co., Peters Bldg., Atlanta, for new one-story addition on Wells St., S. W. Cost estimated over $35,000, with equipment.

American Hair & Felt Co., Chicago, Ill., has let general contract to H. B. Schirmer & Co., 5816 North Washtenaw Ave., for new one-story addition to mill at 930 North Halsted St. E. H. Nordlie, Chicago, is architect.

Ohio Carpet Co., West Warren, Mass., plans rebuilding of portion of mill, recently destroyed by fire. Loss estimated close to $100,000, with equipment.

Volney Felt Mills, Inc., Oswego, N. Y., recently organized by Lloyd Frey and H. B. Munger, Chicago, Ill., have taken over part of former local plant of Arrowhead Mills, Inc.

Merion Worsted Mills, West Conshohocken, Pa., have begun an expansion program at mill.

Branch River Wool Combing Co., Woonsocket, R. I., has awarded contract to Temple & Crane, Boston, for two-story and basement addition to mill at North Smithfield, R. I., 85x350 ft. New unit will cost over $100,000. Lockwood Greene Engineers, Inc., Boston, Mass., are architects and engineers.

Cumberland Gap Woolen Mills, Harriman, Tenn., has rebuilt its drying house recently destroyed by fire.

Peerless Woolen Mills, Chattanooga, Tenn., has had plans drawn for new construction by Robert & Co., Atlanta. A new weave room 400x140 ft., an additional floor on Mill No. 2, which is 460x144 ft., and an 80 ft. addition to another building, all in brick, are shown in the plans.

Staunton (Va.) **Woolen Mills, Inc.,** has been organized by George Musgrave, superintendent at plant of Tiffany Woolen Mills, Webster, Mass., and Gilpin Wilson, Jr., Staunton. A building will be erected by Staunton interests.

Rock River Woolen Mills, Janesville, Wis., have completed the installation of a H-W conditioner for setting the twist in worsted yarns.

"For the Store That Is Going Places"

The above is the title of a most constructive piece of promotional literature issued by Associated Wool Industries and containing practical suggestions for the featuring and advertising of wool apparel. It is the first in a series of news flash bulletins devoted to men's wear to be issued periodically by that organization. This bulletin is being sent to buyers of men's clothing and furnishings, merchandise managers and advertising departments of retail stores.

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Wool Financial Notes

Hopewell Mill, Inc., Glastonbury, Conn., has been incorporated for $50,000 to manufacture wool goods. E. L. Rushmer, L. Glick and S. Lurie, all of 36 West 44th Street, New York, are the principals.

Brookside Woolen Mill, Glastonbury, Conn., has been sold to J. E. Jacobs of New York.

Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn., has arranged for a reduction in capital from $5,500,000 to $2,640,300, par value stock, and 326,500 to 313,609 shares, no par value stock. Sales in 1935 at $19,662,133 recorded a gain of 35½% over 1934.

Ramshorn Mills, Inc., West Millbury, Mass., have been chartered with capital of $20,000, to take over and succeed to the Ramshorn Mills, with local plant, heretofore operated as an interest of Charles F. Day and John B. Davis. Last noted will be president of new organization, and Mr. Day, treasurer.

Gordon Woolen Mills, Hillsboro, N. H., has announced a 5% increase for all employes. A night shift was started recently and business gains are said to be responsible for the increase.

Hinsdale (N. H.) **Woolen Co.,** owned since 1920 by Richard C. Averill of Brattleboro, Vt., has been sold to Louis Stearns, owner of the G. E. Robertson Paper Co. of Hinsdale. The equipment was offered at auction Apr. 10.

Botany Worsted Mills, Passaic, N. J., reports net working capital at end of 1935 of $2,800,723, compared with $2,644,349, the year before. There was a net loss of $93,606 in 1935, against net loss of $856,314 in 1934. Hearing on reorganization of **Botany Consolidated Mills** under 77B has been adjourned to April 24.

Newton Woolen Mills, Homer, N. Y., suffered a loss of $40,000 by fire on March 29. Van Miller, president, said plans are in progress for rebuilding.

National Worsted Mills, Jamestown, N. Y., is continuing its expansion policy and has acquired **Ferncliff Mills,** that city, from the **Cleveland Worsted Mills,** it is announced by J. G. Ellis, general manager of National.

Anniel Woolen Mills, Inc., Mount Airy, N. C., have been chartered with capital of $100,000, to operate a local mill. New company is headed by E. C. Ashby and Oscar V. Radecky, both of Mount Airy.

Artloom Corp., Philadelphia, Pa., recently acquired by new interests, headed by Herbert J. Adair, chairman of board. Atlas Tack Corp., Fairhaven, Mass., has arranged for the establishment of a new division for exclusive manufacture of automobile fabrics. Present mill facilities for this line of output will be increased. C. S. Newton will continue as president and general manager of company.

Stanfields, Ltd., Truro, N. S., manufacturers of knitted wool, silk and rayon, report a net profit for the last fiscal year of $135,042. The assets were reported at $1,670,578.

TEXTILE WORLD'S

Rayon & Silk Digest

SUCH oddly matched companions as fashion and the flood combined their efforts toward the same end in the rayon market last month.

Women's whims concentrated on pigmented taffetas for suits, evening dresses, blouses, and—last but not least—petticoats! The result was pressure on one number of yarn particularly: 100/60-denier viscose.

Nature on the rampage struck a particularly sharp blow at a plant which is one of the chief producers of that denier—thus tending to intensify the shortage in it and to create possibilities of a price advance.

Not often do style and disaster cooperate.—*Editor.*

Reinhard Testifies in Rayon Hearing

The long-awaited testimony of Dr. Samuel Reinhard of Arcadia Knitting Mills proved the highlight of the Federal Trade Commission hearings in its case against the rayon yarn producers last month. Dr. Reinhard took the stand March 18 and his examination, direct and cross, continued for several days. The witness related in detail the story, already much publicized, of the relations between the Viscose Co. and Arcadia regarding maintenance of rayon's quality in the market. The points covered by Dr. Reinhard in his testimony were substantially the same as those cited by the Federal Trade Commission in its complaint.

His story was weakened somewhat in cross-examination. Attorneys for Tubize Chatillon Corp. questioned him closely regarding his contention that the yarn companies refused to sell him yarn after the split with Viscose; this examination brought an admission from Dr. Reinhard that, after the break with Viscose Tubize had offered yarn to Arcadia. Counsel for other defendant companies questioned Dr. Reinhard in an effort to identify him as the prime mover in the charges made against the various companies; this inquiry brought out that one day Dr. Reinhard attended a rayon trade meeting and the day following he had a conference with Harry A. Babcock, associate counsel of the Federal Trade Commission, carrying the implication that he had reported on the rayon meeting to Babcock. The hearing was adjourned to convene in Washington, D. C., April 16.

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Viscose Yarns Active

Continued spirited movement of viscose yarns, particularly the 100/60s for taffetas, and a trend to easiness in acetate movement—these were the chief features of the rayon market this month. Weavers had some difficulty in getting delivery on the 100/60s because the floods had halted production of this yarn in one of the major plants. April *Organon* estimates total production loss at 6,000,000 lb. Producers expected taffeta interest to extend into the warm months, but were dubious on catching up with orders.

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Silk Jumps 15c in "Dead" Month

Raw silk importers entered April in a happy frame of mind. Though March was one of the quietest months in some time as regards demand, and the sales outlook far from encouraging, yet prices of the principal sizes rose about 15c. between March 1 and April 1. Explanations of this differed, the general opinion being that speculation in Japan was responsible. Demand from weavers was negligible. It is now reported that the silk underwear branch is turning strongly to rayon. Hosiery mills, it is felt, will have to buy soon.

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Fabrics Are Backward

With current interest limited to the early triple sheers, broadsilk manufacturers were doubtful this month that any last-minute Easter call would serve to make up for the poor season in spring prints. Demand was moderately good in January but the prolonged winter discouraged February sales, with the result that there has been little profit in any spring lines for the last four weeks.

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Gerli Circle Widens

The continuing expansion of the Gerli interests in the broadsilk industry was brought twice to trade notice this month; first, R. C. Kramer, president of Belding Heminway Co., which firm is controlled by the Gerli group announced completion of a merger which would take in Klein Bros., silk manufacturers. Under the plans Klein becomes a division of Belding and Adolph Klein becomes vice-president of the parent company. This news was followed by the announcement that E. Gerli & Co. would advance $200,000 in a plan for reorganization of H. R. Mallinson & Co., Inc. The Mallinson reorganization plan was scheduled to be finally submitted to the court April 7.

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Caution on Taffetas!

Rayon taffetas were in spirited demand for a wide range of uses, including women's suits, blouses, and last but far from least the inevitable petticoats, during March and some mills looked for the activity to continue through this month. Market opinion as to whether rayon possesses the requisite "rustle" for petticoat service was divided and it was evident this question can be finally answered only by the consumer. However, it was emphasized that the manufacturers should avoid heavy output of these fabrics since the warm weather will naturally slow up sales and it is not yet assured that taffeta petticoats will be important in fall.

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Merger Project Dropped

Hiram S. Rivitz, president of Industrial Rayon Corp., last month confirmed reports that merger with Tubize Chatillon Corp. had been considered some time ago, but added that negotiations had been dropped. The report excited much market attention because of the leading position both firms occupy in the tubular rayon fabric field.

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Industry Briefs

Throwsters Reelect—Reelecting Henry J. Tynan, of the Tynan Throwing Co., as president, last month, the Throwsters Research Institute elected Wm. R. Rossmassler, of the Sauquoit Silk Mfg. Co., as vice-president, succeeding John Salandi, who resigned because of pressure of private business. All other officers were reelected.

For the Boardwalkers—The DuPont Exhibit on the boardwalk, Atlantic City, has been enlarged to 6,000 ft. and has added many new features to increase the effectiveness of fashion shows presented there. The remodeled exhibit was opened March 23.

Belden's Shingle is Out—Frank E. Belden, former advertising manager for Industrial Rayon Corp., and editor of the now discontinued Premier Rayon Review, has formed a new firm, Belden Associates, Inc., of 1125 Rockwell Ave., Cleveland, which will handle general advertising, sales promotion and direct mail. Mr. Belden is well known in the rayon merchandising field.

Watch 'Em Grow!—Expansion of activities has compelled the National Rayon Weavers Association to move its office at 40 Worth St., New York, from the 14th floor to larger quarters on the 12th floor.

Susquehanna Assets Turned Over—On order of the Federal Court, the

assets of the Susquehanna Silk Mills were turned over March 30 to a new company which will conduct the business of that old-established firm. No opposition was made to the plan.

British Rayon Week—With the thought that it may offer a model for adoption here, American rayon merchandisers are closely watching the plans for the British Rayon Week, beginning May 18; among the many interesting points of this event is the fact that it will highlight the term "rayon."

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Rayon Weavers Growing

Rayon consumption for broadgoods continues to veer sharply toward the rayon mills represented by the National Rayon Weavers Association, according to figures just issued by that body. The figures show that the association group consumed 73.5% of all rayon going into broad woven goods in 1935. Figures from *Rayon Organon* show that of 251,722,000 lb. of yarn produced in 1935, 71% of 178,900,000 went into broad goods.

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Current Rayon Data

Key rayon prices and statistics follow:

Prices:

	Apr. 1 1936	Mar. 2 1936	Apr. 1 1935	Apr. 1 1934
Viscose Process				
75 denier (18-30 fils)	$0.90	$0.90	$0.92	$1.00
100 denier (40 fils)..	.79	.79	.80	.85
150 denier (40 fils)..	.57	.57	.60	.65
Acetate Process				
150 denier.....	.60	.60	.68½	.78
Cupra. Process				
150 denier (112 fils).	.65	.65	.67½	.90

***Statistics**

	Indices of Deliveries†	
	1936	1935
Mar.....	422	295
Feb.....	516	441
Jan.....	477	553

**Rayon Organon.*
†Exclusive of acetate. Daily average 1923-25 = 100.

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Current Silk Data

Key silk prices and statistics follow:

Prices:

	Apr. 1 1936	Mar. 2 1936	Apr. 1 1935	Apr. 1 1934
Crack XX 13/15 white 78%.....	$1.88	$1.72½	$1.34	$1.40
Tram, 5thd Japan 85%.....	2.50	2.38	2.20	2.27½
Tram Crack XX 78%.....	2.37	2.25	1.95	2.07½
60s-2, spun silk....	2.90	2.90	2.75	2.95

Statistics

	Imports	Approx. Deliveries	Stocks at Warehouses
Jan. 1936....	40,565	38,995	56,511
Feb. 1936....	40,222	32,053	64,680
Mar. 1936...	25,009	36,000	53,689

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Skinner & Co. Expands

The announcement that five executives had been added to the personnel of William Skinner & Co. draws attention to the fact that this veteran silk manufacturing firm, now nearing the century mark, is substantially expanding its activities. Among the new divisions of the company are a Research and Planning Bureau, headed by A. A. Barkowsky, formerly of the National Federation of Textiles; and widening of the styling and merchandising functions. Other additions to the staff are Miss Frances Johnson, design and color artist; H. Fredericks, ready-to-wear cutters; John Baker, retail trade; and Wm. McCaughin, in Los Angeles office. The Skinner company was formed in 1848 and has been internationally known as an all-silk house; only recently did the company begin making rayons and now they make 50% silk and 50% synthetic fabrics.

RAYON & SILK IN THIS ISSUE

	page
New Satin Season Will Produce More Fabric Changes	87
Fugitive Tints Now Aid Knitter and Weaver	109
Regarding the Loomfixer	119
Design for Shirting	120
Soiled Knots in Rayon	120
Knot Kinks in Georgette Crepe	121
Photoelectric Cell Adapted to Raw Silk Grading	126
High-Speed Silk Warping	127

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Rayon and Silk Mill News

Ming Toy Silk Mills, Inc., 1441 Broadway, New York, N. Y., is reported to have concluded arrangements for purchase of mill of Aronsohn & Hirschfeld Silk Co., Inc., Morristown, Tenn., and will take over and operate. Plans are under way for expansion, including new addition to existing mill and installation of equipment.

Stone Silk Mill, Inc., New York, N. Y. and Paterson, N. J., has leased the former Manhattan Bldg., Ogdensburg, N. Y., and installed equipment. David J. Saperstein, formerly of the Fulton (N. Y.) Silk Mill, Inc., has been named manager. The Fulton plant has discontinued operations.

Tynan Throwing Co., Paterson, N. J., have installed a new H-W water-vapor humidifier.

Malina Co. of N. J., Paterson, N. J., has purchased two H-W conditioners for setting twist on rayon.

Barnes-Adams Throwing Co., High Point, N. C., recently formed with capital of $100,000, has begun operation local silk mill. Wilton H. Barnes and E. R. Zane, both High Point, head the company.

Viscose Co., Meadville, Pa., has awarded general contract to Wark & Co., 1608 Walnut St., Philadelphia, Pa., for new additions to mill, comprising three main units, six-story, 105x305 ft., one and three-story, 250x338 ft., and two-story, 270x315 ft., respectively. Superstructure will begin at once. New additions will double present capacity and are estimated to cost over $1,000,000, with machinery. Ballinger Co., Philadelphia, is architect and engineer.

Roanoke Weaving Co., Inc., Vinton, near Roanoke, Va., recently organized as a J. Spencer Love interest, has awarded general contract to Charles W. Angle, Inc., Greensboro, N. C., for new one-story mill, 240x250 ft., on site acquired near Tinker Creek, Vinton. Plant will contain 220 looms. It will cost close to $100,000.

This silk print in the new copper tones proves its adaptability for tropical and summer wear. The formal note, when desired is supplied by the matching jacket. The International Silk Guild calls it a "bareback racetrack dress"

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Rayon and Silk Financial

Net profit and net loss of leading silk and rayon manufacturers for 1935 and 1934 follow:

	1935	1934
Sidney Blumenthal & Co., Inc.....	$610,215	$1,031,483*
Celanese Corp. of America	4,057,227	3,229,459
North American Rayon Corp.	906,911	533,410
American Bemberg Corp.	491,710*	493,650*
LaFrance Industries.	406,891*	304,182*
Canadian Celanese, Ltd.	1,602,960	1,504,709

*Indicates net loss

Belding Heminway Co. has purchased the **Bedford (Va.) Weaving Corp.,** and by merger with Klein Bros., re-enters the fabric production field after an absence of three years. The Bedford company in operation only since May, 1925, operates 120 modern automatic looms with latest type accessories. R. C. Kramer is president of Belding-Heminway and Adolph Klein has become vice-president in charge of the fabric division. The "Marillyn" name for silks produced by Klein will be retained.

Haskell Silk Co., Westbrook, Me., has received approval of the RFC for a loan to permit continuation of the business.

Haledon (N. J.) Silk Mfg. Co. has been placed in the hands of E. R. Cooper as custodial receiver.

Adam Silk Co., 432 Cloud Street, Philadelphia, Pa., suffered a loss by fire at their plant on March 14.

Roane Textile Mills, successors to the **Cumberland Silk Mills,** Rockwood, Tenn., have begun operations. H. O. Edgar is manager of the new organization. S. H. Rieback, New York, is president.

DuPont Rayon Co., Ampthill, near Richmond, Va., is said to have in abeyance a plan for a $5,000,000 addition to its local plant providing relief may be had from certain industrial wastes which the company indicates threaten the suitability of its water supply in the James River. The expansion will be effected at Old Hickory, Tenn., or elsewhere, if the water supply situation at Ampthill becomes a barrier.

TEXTILE WORLD'S

Knit Goods Digest

COOPERATION between the hosiery and underwear groups toward insuring the success of Knit Goods Week is now a habit, and a good one.

For the third successive year, these two industries unite this month in staging Philadelphia's classic, the Knitting Arts Exhibition. Annual conventions of both the National Association of Hosiery Manufacturers and the Underwear Institute are also scheduled for the same week.

There are plenty of problems facing knitters but the business tone is better this year and so the manufacturers bring toward the solution of those problems a surer confidence and therefore a greater chance of success.—*Editor.*

Hosiery Shipments Increase

Following the rather remarkable stability shown by the hosiery industry in January in spite of several unfavorable market factors, total shipments of hosiery in February, 1936, rose approximately 2% over the preceding month to 8,662,068 doz. pr., according to data prepared by the National Association of Hosiery Manufacturers. Shipments of women's full-fashioned hosiery in February, 1936, totalled 2,434,615 doz. pr. This figure represented a gain of 319,692 doz. pr., or 15%, over shipments for the preceding month, and was about in accordance with seasonal expectations. Shipments of all seamless types in February, 1936, totalled 6,213,955 doz. pr., a decrease of 2% as compared with the previous month.

Total shipments of all types in February of 1936 were less than 1% below shipments in February of 1935. Full-fashioned shipments came within 5% of the pace set in February of 1935, while seamless shipments in February of this year exceeded by a slight amount the figure for one year previous.

Production of all types of hosiery in February, 1936, amounted to 9,251,714 doz. pr., a decline of 847,690 dozen pairs, or 8 per cent, as compared with the preceding month. Stocks of all types of hosiery on hand at the end of February, 1936, were 19,749,522 doz. pr., a gain of 589,646 doz. pr. over stocks on hand at the end of January, and an increase of 721,941 doz. pr. over stocks on hand at the end of February, 1935.

The following table shows the relationship between shipments and production in February, 1936, and the effect of such relationship upon stocks, for certain selected types of hosiery:

Type of hosiery	Stocks on hand Jan. 31 1936	Production February 1936	Shipments February 1936	Amounts by which shpts. were more than (+) or less than (—) Production	Stocks on hand Feb. 29 1936
Total, all types	19,159,876	9,251,714	8,662,068	—589,646	19,749,522
Women's full-fashioned	5,092,170	2,751,670	2,434,615	—317,055	5,409,225
Women's Seamless, excluding wool	1,718,909	882,326	856,434	— 25,892	1,744,801
Men's Half-hose, excluding wool	5,486,183	2,648,245	2,371,301	—276,944	5,763,127
Children's and Infants' Hosiery*.	1,102,762	532,322	535,370	+ 3,048	1,099,714
Anklets	3,623,215	1,583,840	1,818,175	+234,335	3,388,880
Cotton Bundle Goods	650,146	353,059	299,439	— 53,620	703,766
Ribbed Goods	823,787	248,264	250,925	+ 2,661	821,126
Woolen Goods†	662,704	251,988	95,809	—156,179	818 883

*Boys' and Infants' Socks, Children's ½ flat and ½, Boys' Golf Hose. †Women's and Men's Seamless Wool, Men's Golf Hose, Woolen Bundle Goods.

New 40-Hour Week Plan for Seamless

As the outcome of several weeks of vigorous activity by Earl Constantine, managing director of the National Association of Hosiery Manufacturers, there were signs this month that the threatened collapse of the 40-hour week among women's seamless hosiery mills in the South had been averted. During March the problem appear to be nearing a critical point, with the result that prices had dropped 35c. to 50c. per doz. Contending they were forced to longer hours in self-defense against other firms which already operated 50 hours, the Hanes Hosiery Mills Co., Winston-Salem, N. C., went on a 50-hour week. Most of the remaining seamless manufacturers expressed doubt that they could long stay on 40 hours against such competition.

Feeling that quick action was needed, Mr. Constantine held two conferences of manufacturers in the South, which meetings he said, showed that "conditions were not nearly as bad as painted and proved that all manufacturers would welcome some equable method of retaining the code standards." The first meeting, at Greensboro, N. C., was held March 27, attended by 15 firms; the second, April 3, at Asheville, N. C., was attended by 30 firms. The manufacturers frankly pooled their figures regarding hours of operation, etc., and this openness, Mr. Constantine said, helped toward constructive negotiations.

The association now hopes to evolve a policy by which these manufacturers can maintain standards approximating those under NRA. It is believed this may be accomplished shortly, as the trade has already shown itself in favor of such action.

Swimsuit Buyers Lean to Quality

Increased volume, especially in the higher priced lines, was the feature of the swimsuit market during March, and these knitters entered April with considerably more business booked than had been the case this time last year. A notable point is that buyer interest which last year centered on $2.95 lines of men's trunks now focussed on the $3.95 line and this trend is evident in various lines. A survey made by the National Knitted Outerwear Asociation disclosed that there has been a marked drop in the total of bathing suits rented at beaches last year against previous years which the association cite as pointing toward increased business.

Underwear Hesitant

Underwear buying this month was held down largely to nearby requirements. Mills reported summer lines moving slowly. However, the total spring business has been in excess of 1935 in numerous cases, and several foremost firms also note a trend toward higher priced garments. In women's lines for summer interest centered on blush, tea-rose shades in conservative designs. Men's summer lines had not picked up enough to show any definite preference.

"Philadelphia Week" Market Highlight

Interest in Philadelphia's "Knit Goods Week" took precedence over current market trends among hosiery and underwear manufacturers this month. Both conventions face vital problems which lend increased significance to the gatherings. It was indicated that selling markets would be more deserted than usual during convention week this year because of the important Philadelphia program.

Short of Shorts?

Various mills this month reported increased interest in supporter shorts—the abbreviated item of men's underwear which shot up like a rocket last year—and then, supposedly, died. During March various retailers in New York began to promote this line again, and buyers were questioning their

sources as to the prospects for shipment of such merchandise; some feared there might be a scarcity. All of which suggests that the supporter underwear may again prove an active summer line, since its chief advantage is coolness in warm weather.

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Mock, Judson Expands

Mock, Judson, Voehringer, Inc., full-fashioned hosiery manufacturers at Greensboro, N. C. have ordered about $200,000 worth of new equipment for the addition to their Greensboro mill which has been authorized. The addition will increase output 25% and will add 300 persons to the payroll.

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Knitting Mill News

Athens (Ga.) **Hosiery Co.,** recently organized, has closed bids on general contract for mill at Hillcreast St. and Brookwood Dr., where a tract of land has been selected. Main unit will be one-story, 107x200 ft., with adjoining building, one-story, 34x42 ft., for mechanical service. Cost over $200,000.

Brunswick (Md.) **Mills, Inc.,** T. H. Brown, Philadelphia, president, has begun operations on hosiery dyeing by special process in a new $12,500 plant.

Wolf Mfg. Co., Milford, N. H., is moving to Lowell, Mass.

Rathgeb Knitting Mills, Highland, N. Y., have plans for new one and two-story addition, 50x100 ft., and will begin work on superstructure early in spring, to cost about $45,000.

Mayburn Knitting Mills, Inc., 352 Fourth Ave., New York, N. Y., have leased property at Netcong, N. J., and will remodel for purpose of moving present plant to new location.

Waterville (N. Y.) **Textile Mills** have acquired a former local school building, and will remodel for expansion at knitting mill.

Biltmore (N. C.) **Hosiery Co., Inc.,** has purchased a large brick building at Naples, N. C., and will install machinery for full-fashioned hosiery.

R. D. Wilson and associates, Burlington, N. C., is establishing a $150,000 full-fashioned hosiery mill in that town. It will have 10,000 sq.ft. floor space and operate 12 Reiner machines.

Glen Raven (N. C.) **Cotton Mills,** one of the pioneer textile mills of Alamance County, will soon enter the hosiery manufacturing industry. Eight full-fashioned hosiery machines have been purchased and will be installed in a building at Altamahaw, near Burlington.

The following, in a special letter to members of the Underwear Institute from Roy A. Cheney, managing director, wafted a touch of spring across the editorial desk the day it arrived:

Gentlemen:

The other day a woman blew her husband out of a chair with a shot gun.

She had gotten tired of the long, hard winter.

It *has* been a long, hard winter, wearing upon the nerves, but where this condition results in unwarranted competition, cutting of prices and suspicion, the net result is simply less profits to the mills which become explosive along these lines.

KNIT GOODS IN THIS ISSUE

	page
Guide to 32d Annual Knitting Arts Exhibition	93
Going South? Re-Location No Automatic Solution	97
New Half Hose—Original Patterns for 1936	99
Underwear Fabrics on Which Knitters Are Relying	100
$49,000 a Year Saved by a Standard Cost System	102
Tale of a Pail—It Started Modernization Program	104
Seamless Hosiery Progresses—Recent Improvements	106
Proper Storage and Nets Economize Hosiery Dyeing	107
Rib Cuffs and Bottoms on Flat Machine with Racking	108
Fugitive Tins Now Aid Knitter and Weaver	109
Finishing Balbriggan	119
Knit Fabric Sleazy	121
Electrical "Jacquard"	127

C. B. Goodman and **John Brooks,** Hickory, N. C., are planning to open another hosiery mill with 20 machines.

Diamond Full-Fashioned Hosiery Co., High Point, N. C., has plans for one-story addition, 40 x 130 ft., for expansion in finishing department, to cost over $40,000.

Lipper Mfg. Co., Philadelphia, Pa., has leased floor in building at 250 West Cambria St., and will occupy for local mill.

Lucky Stripe Silk Stocking Co., 6425 Hegerman St., Philadelphia, Pa., has concluded negotiations with municipal officials at Fitzgerald, Ga., for establishment of a branch mill. This enterprise was incorrectly referred to as "Lucky Strike Hosiery Co." last month.

Superior Knitting Mills, 3747 Ridge Ave., Philadelphia, Pa., is planning an addition of brick and steel, 101 x 53 ft.

True Tex Hosiery Co., Wernersville, Pa., has opened a hosiery mill at Paducah, Ky.

Charleston (Tenn.) **Hosiery Mills,** began operation in March with about 50 machines. Richard Edge is president and general manager. Fifty-four gauge anklets and half hose are made.

Decatur (Tenn.) **Hosiery Mills, Inc.,** has started construction of a 30 x 80 ft. main mill and 20 x 30 ft. dyehouse to produce anklets.

Strickland Hosiery Mills, Nashville, Tenn., with plant at local State Prison, will remove at early date to Petersburg, Tenn. Capacity will be increased.

Niota (Tenn.) **Mills, Inc.,** recently organized with capital of $50,000, have approved plans for one-story mill on full-fashioned hosiery, to be one-story, 80 x 120 ft., and to cost about $35,000.

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Knitting Financial

Financial reports of leading knit goods manufacturers for 1935 show their earnings for 1935 and 1934 as follows:

	1935	1934
Holeproof Hosiery Co.	$3,397	$330,107*
Adams-Millis Corp...	556,864	648,953
Federal Knitting Mills Co.	91,401	121,634
Celtic Knitting Co., Ltd.	44*	2,803
Real Silk Hosiery Mills	374,830	355,732*
Regent Knitting Mills.	457,156	399,964
Oscar Nebel Co.	32,075	5,229*
Zimmerknit Co.	19,260	21,193
Mercury Mills, Ltd.	135,030	31,413
Monarch Knitting Co..	107,718	135,063
Regent Knitting Mills	10,462	28,851

*Indicates net loss.

De Funiak Springs, Fla.—Better Business Bureau has negotiations under way for the establishment of a local hosiery mill. Initial plant is reported to cost about $35,000.

Douglas (Ga.) **Silk Products Co.** has been established to operate a hosiery mill in Douglas.

Lowell (Mass.) **Knitting Mills** sold its equipment and stock at auction in mid-March, realizing about $23,000.

Medford (N. J.) **Knitwear Mills, Inc.,** has incorporated. B. Edward Arndt, Medford, is principal incorporator.

Friendly Knitting Mills, Inc., Brooklyn, N. Y., have arranged for increase in capital from $10,500 to $50,000.

Dunlap Knitting Mills, Inc., Troy, N. Y., have been chartered to operate a mill on River St. Principal incorporators are Barnet Beckenstein and Harry Rubenstein, both at 282 Sixth Ave., North, Troy.

Concord (N. C.) **Silk Throwing Co.** has been chartered, and will manufacture hosiery under an authorized capital stock of $150,000, with $50,000 subscribed by A. R. Hoover, A. R. Howard, and H. M. Grey, all of Concord.

Durham Hosiery Mills has leased, with option to buy, all its property in Mebane, N. C., to the **Mebane Yarn Mills, Inc.** This includes a 10,000 spindle fine yarn mill, a small vacant knitting mill and mill village.

Artex Knitting Mills, Inc., Cleveland, Ohio, have been chartered with capital of $15,000, to manufacture knit goods. Incorporators include Morris and Louis Vinocur, 3646 East 163rd St., Cleveland.

Glen Echo Knitting Mills, Philadelphia, Pa., have filed notice of organization to operate a local mill at Berkley and Greene Sts. Company is headed by George W. Kritler, Roberts Ave., Glenside, Pa.

Noble Knitting Mills, Philadelphia, is managed by Albert H. Goldstein and is located at Darien and Noble Sts. This corrects an item previously published in these columns.

Nolde & Horst Co., Reading, Pa., has concluded negotiations for acquisition of plant of **Read Hosiery Mills,** McMinnville, Tenn., and will use for branch knitting mill. Company will carry out an expansion program. Sims Read, who has operated the plant for 18 years, will continue as manager.

Princess Royal Hosiery Mills, Inc., formerly the Noe-Equl Textile Mills, Reading, Pa., is in process of a 77B reorganization.

Aycock Hosiery Mills, Jasper, Tenn., was offered for sale at auction on April 4.

Ideal Hosiery Mills, Maryville, Tenn., is in process of liquidation.

Lorain Hosiery Mill, Sweetwater, Tenn., has been formed to set up a $50,000 hosiery mill in Sweetwater.

Kenmore Hosiery Co., Inc., Fredericksburg, Va., headed by John H. Bauer, has closed negotiations with municipal officials for construction of a new mill, financing to be arranged in part by the municipality. Mill will be one-story, estimated to cost about $40,000. Interests behind it operate mill in Pennsylvania.

Pannill Knitting Co., Martinsville, Va., is said to have plans for new four-story addition to mill, estimated to cost over $80,000.

American Knitting Mills, Inc., Menasha, Wis., have incorporated to manufacture, deal in knit goods. Incorporators are Howard W. Nussbicker, Appleton, Wis., and William Krause and Clement Sokolowski, of Menasha, Wis.

TEXTILE WORLD'S

Processing Digest

DRYING is drying, to a great many textile manufacturers. If they give any thought to it at all, it is as one of the simplest processes which pretty much takes care of itself. About the only precaution they would suggest is to guard against excessively high temperatures.

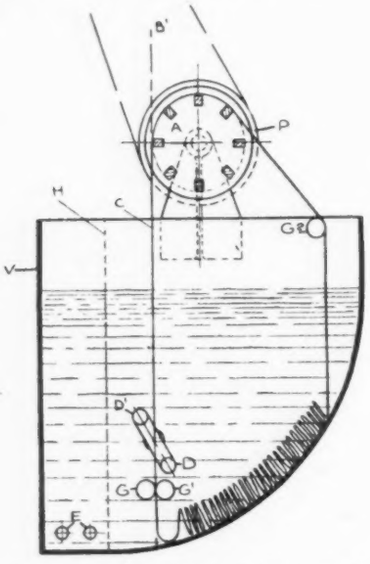
But it's not as simple as that. There are many variables besides temperature. For example, there are time, moisture content or regain of the fiber, humidity of the air, etc. There is also the fundamental question of chemical, in addition to physical, effect of drying upon the fibers. Then, too, the effect upon the various sizing materials contained in the fabrics is a whole series of problems in itself.

That is sufficient, we believe, to indicate that the conference on drying to be held in New York, May 6, by the U. S. Institute for Textile Research, can hardly be called superfluous. It offers a challenge to chemists, engineers, operating executives, and all others interested in the substitution of science for empiricism in textile processing.

Consequently, the S. R. O. sign called into use at the Institute's last research conference should come in handy at this one too.—*Editor.*

Dyeing Wool at Low Temperatures

A new process of dyeing wool goods in an open vessel at temperatures well below the boiling point was demonstrated in Bradford, England, last year by chemists of Imperial Chemical Industries, Ltd., and reported at that time in these columns (*T.W.*, March, 1935.) Two patents have now been taken out in connection with the process—B.P. 441,660, covering the equipment; and B.P. 486,-875, for the further improved process.



Reel machine fitted with special "bombarding" device to permit dyeing of wool at low temperature.

The classic recipe for wool dyeing is "dye at the boil for 1 to 2 hours." In view of the affinity of the fiber for coloring matter, many dyers have argued that it is not the high temperature, but the penetrative action of "the spring of the boil," that effects fixation. Also there is apparatus in use in which steam is introduced into the dyebath in one way or another, but always with the view to obtain both high temperature and turbulence. In the new process, the dyeing is at lower temperatures than customary, with advantageous effect on the fiber, in a liquor driven against the material from all sides in a succession of impulses by the separate bubbles of gas. This is in direct contrast to the smooth circulation set up by a direct stream of gas, as in conventional types of equipment.

Ordinarily chrome and acid dyes are used. With the new method, a shorter bath and a lower acid concentration can be employed and with dyes that tend to decompose in a boiling bath, and a more uniform and sometimes a brighter shade is obtained.

The necessary equipment is very simple, as can be seen from the accompanying illustration. A tank *V* has a reel driven by a pulley *P*. The fabric in a continuous chain is circulated through the dyebath by means of the reel and guide rolls *G* and passes between perforated pipes *D* and *D*1. These pipes are so fixed, one on each side of the fabric, that they are parallel to its face and at right angles to the selvage. They are set at such an angle to the perforations that the axes of the perforations of one pipe are not in the same place as the axes of the perforations of the other. Air, steam, or a mixture of the two is forced through; and the fabric, as it passes between the pipes, is bombarded with bubbling liquor. The perforations should be 1 in. apart and the pipes 2 in. from the fabric. The number of pipes *D* may be increased. Closed steam coils *E* keep the dye liquor hot, from 60 to 80° C.

The position of the perforations in the two pipes in relation to the fabric is important. When the perforations are arranged as described, the hydraulic pressure on one side does not neutralize the pressure on the other side.

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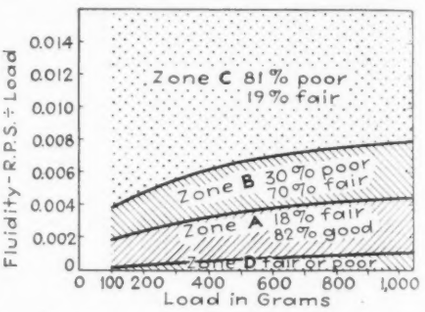
Better Vat Prints Promised by Research

Vat prints of better and more uniform quality are promised as a result of research on vat printing pastes reported by Sivert N. Glarum, A.A.T.C.C., Research Associate, at Brown University. This investigation (*American Dyestuff Reporter*, March 23, 1936) has shown that there is a direct correlation between the flowing properties of vat printing



Fluidity of vat printing pastes and effect on quality of prints.

pastes and the quality of the prints produced, and has established definite limits for the flowing properties of those pastes which will most accurately reproduce fine patterns on various fabrics. Measurement of the flowing rate, or fluidity, by means of a Stormer viscometer is expected to lead to many practical applications, such as control of fluidity for production of any desired effects, reproduction of paste so that prints can be accurately reproduced from time to time, and comparison of the properties of various thickeners. The investigation showed also that the temperature of the printing roll should be carefully controlled, as it has a marked effect on fluidity of the paste and, hence, on the quality of the print. As can be seen from the accompanying chart, pastes having a fluidity within the limits of the zone *A*, are most suitable, giving 82% good prints and 18% fair prints. Pastes not falling in zone *A* give only fair or poor prints.

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Textile Chemists Discuss Dyeing of Acetate Fabrics

Dyeing of acetate fabrics and the causes and prevention of defects in these materials were discussed at a meeting of the New York Section, A.A.T.C.C., held March 27, in Paterson. Harry Price, of Celanese Corp. of America, was the principal speaker; Dr. H. D. W. Smith,

of A. M. Tenney Associates, led the discussion.

According to Mr. Price, moire—one of the most common defects in acetate taffetas—may be due to uneven sewing of the pieces, too much or too little tension on the jig, sudden changes of temperature in processing solutions, allowing the fabric to stand too long in a wet condition, and presence of too much soap or oil in the dyebath; there is no cure-all for moire, but two ends in hot water may help to remedy it. Shaded selvages may be caused by too long a scour, tight selvages, failure to run the fabric straight on the jig, and too much soap or oil in the bath. The chief cause of endedness is the use of improper combinations of dyes; i.e., combinations containing both high- and low-temperature dyeing colors; other causes are too high a jig speed and changes in temperature of the dyebath. Crocking is usually due to improper dissolving of the dye or to adding the dye to the bath too quickly. Marking on the surface of the fabric is caused by insufficient scouring of the goods.

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Mellon Institute Notes Advances in Textile Finishing

Advances in textile finishing through the improvement of processing compounds are noted in the 23rd annual report of Dr. E. R. Weidlein, director, Mellon Institute of Industrial Research, Pittsburgh, Pa. In this connection, the report states: "On the industrial fellowship of the Onyx Oil & Chemical Co. and associated companies, R. N. Wenzel has continued during the year his investigations relating to processing compounds for textile finishing. Particular attention has been given to the improvement of preparations for the waterproofing of open fabrics. The water-repellent properties of an extensive list of available proofing agents have been explored by measurement of interfacial contact angles; and procedures have been developed for preparing the most active agents in the form of concentrated aqueous emulsions, which were required to be fluid, stable, of controlled pH, effective from extremely dilute baths, and compatible with auxiliary agents used to modify the appearance or feel of the finished fabric. This research has led to the manufacture of new products now being offered to textile mills. The fellowship has also cooperated with the donor in certain investigations pertaining to a new line of sulphonated products for use as wetting, emulsifying, and levelling agents."

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New Dyes

E. I. du Pont de Nemours & Co. announces the following new products: Pontachrome Azure Blue BR, a chrome color of good general fastness for use in dyeing bright, medium shades of blue on wool rawstock, yarn, and piecegoods; Sulfanthrene Orange RC Paste, Sulfanthrene Brown GC Paste, and Sulfanthrene Scarlet GC Paste, three vat colors especially designed for printing delustered rayon, but suitable also for printing bright rayon and acetate materials.

General Dyestuff Corp. announces the following new products: Indanthren Yellow 4GK Powder, fine for dyeing, a new vat dye, yielding a greenish yellow shade of a fastness to light not achieved previously with the same shade in the Indanthren range; Palatine Fast Black SRN extra, a new addition to the Palatine Fast range, yielding a bright deep black of good fastness to light, washing, fulling, and perspiration and very good fastness to water, sea-water, hot pressing, carbonizing, decatizing, and stoving; Fastusol Grey LVGL, a homogeneous direct dye, yielding bluish grays of very good fastness to light; Fast Silk Yellow G, a new silk dye of great dyeing strength and good fastness to light, water, washing, and perspiration, and having a good affinity when dyed from a soap bath or from a neutral or weakly alkaline glauber salt bath; and Fast Golden Orange Salt GR, a fast color salt, yielding a range of clear and fast golden orange shades in combination with Naphtols AS, AS-D, AS-SW, AS-E and AS-TR.

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Industry Briefs

Value of loans made by the Reconstruction Finance Corporation to dyeing and finishing companies and outstanding on December 31, 1935, totaled $6,240,300 according to the quarterly report of the Corporation filed with Congress, March 18. Thirteen firms have received such loans since the R.F.C. act was passed.

A complete line of new waterproof fabrics for yachting use, known as Goodrich-Giltex, is being distributed by Gill Corp., Cambridge, Mass. These fabrics are impregnated with a solution of Koroseal, a synthetic rubber-like material developed by B. F. Goodrich Company.

Spring meeting of the Southeastern Section of the American Association of Textile Chemists & Colorists will be held at 7:00 p.m., April 25 in Thomas Hotel, Auburn, Ala. Papers will be presented on "Termites and Their Control," "Mercerization Research, Its Value and Practical Application," and "Permanent Finishes on Textile Fabrics."

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Processing Plant News

Brunswick (Md.) **Mills,** recently organized by Thomas H. Brown, Second and Westmoreland Sts., Philadelphia, Pa., hosiery manufacturer, and associates, will operate a local dye and finishing mill. Mr. Brown will be president and general manager of new company.

R. W. Bates Piece Dye Works, Garnerville, N. Y., have installed their second large Inversand zeolite water softener machine.

Hanes Dye & Finishing Co., Winston-Salem, N. C., has started erection of new one-story addition to mill, for which general contract recently was awarded.

Philadelphia Textile Finishers, Inc., with headquarters at 900 Market St., Wilmington, Del., has established a plant for treating and finishing textile fabrics at 2223 East Auburn St., Philadelphia.

Fairforest Finishing Co., Spartanburg, S. C., has awarded general contract to Fiske-Carter Construction Co., Greenville, S. C., for new one-story 400 x 50 ft. addition, to be used primarily for storage department, doubling present facilities of that division. Cost $50,000.

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Processing Financial

United States Finishing Co., New York, reports net loss of $796,326 for 1935 on gross income of $6,114,259. This excludes Hartsville Print & Dye Works which was operating under court order in 77B proceedings. It compares with a net loss of $724,470 for 1934 on a gross income of $7,301,282, including Hartsville. The parent company consummated its reorganization plan and loan from RFC on June 3, 1935.

Joseph Bancroft & Sons Co., Wilmington, Del., reports net loss of $159,894 for 1935 on net sales of $4,935,406, against net loss of $352,241 for 1934 on net sales of $4,285,000.

Crew Piece Dye Works, Inc., East Paterson, N. J.—Former mill of this company at Madison, Morton and Beech Sts., Paterson, vacated a number of years ago, is being razed. The plant is said to be the oldest silk piece dyeing plant in the State.

Millbank Finishing Co., Lodi, N. J., in reorganization, has been sold to Thomas O'Brien, Bloomfield, N. J.

Imhoff-Paillard Piece Dye Works, Paterson, N. J., have taken over the Strengs plant in Haledon, N. J.

Sun Dyeing Works, West New York, N. J., is in bankruptcy. Robert P. Stephenson, New York, is referee in bankruptcy.

Finco Print & Dye Works, Inc., Brooklyn, N. Y., is in process of a 77B reorganization.

Whitestone Dye Works, Inc., Maspeth, L. I., has petitioned the court for 77B reorganization.

Apollo Bleaching & Dyeing Works, Inc., New York, N. Y., recently organized with capital of 200 shares of stock, no par value, plans operation of new dye and finishing mill in this vicinity. Company is represented by Nicholas Castaldi, 150 Broadway, New York, attorney.

Columbia Mills, Inc., 225 Fifth Ave., New York, N. Y., have leased space in building at Eleventh St., and Clark Ave., St. Louis, Mo., and will occupy for local branch mill.

Manhattan Cloth Finishing Co., Inc., 57 West Nineteenth St., New York, N. Y., has arranged for increase in capital from 100 to 500 shares of stock, no par value.

Richmond Industries, Inc., of which Leslie G. Thom is president, has changed its name to **Richmond Piece Dye Works, Inc.** Herbert Seiben has been named production manager. The plant is located at 3rd and Hull Streets, South Richmond, Va.

Arnold Print Works, North Adams, Mass., have been given an extension to June 1 for filing 77-B reorganization plan.

Passaic (N. J.) **Print Works** consented to an equity receivership suit, and Wm. S. La Porte was appointed equity receiver.

Cadgene Piece Dye Works, New Brunswick, N. J., was offered at auction on April 6 by the administrators of the estate.

PROCESSING IN THIS ISSUE

	page
Finishing Plants Find Good System of Lot Chasing	92
Tale of a Pail—It Started Modernization Program	104
Proper Storage and Nets Economize Hosiery Dyeing	107
Finishing Balbriggan	119
Spray Printing of Carpets	120

TEXTILE WORLD'S

Engineering Digest

THE floods last month imposed serious responsibilities upon textile mill management and personnel. They also presented an opportunity—the chance to clean house and to effect long-delayed modernization. Faced with the unpleasant job of spending time and money to get water-soaked equipment of ancient vintage into at least temporary running condition, engineers have recommended to their executives the alternative of spending a little more and getting a real job done. Those manufacturers who acted affirmatively on this recommendation will not regret it.

The flood carried another lesson. Plant engineers, already overburdened by the huge task of bringing mill equipment into efficient operation after a long period of idleness, were faced with a new emergency. It sometimes takes an emergency to show the value of something and to test the mettle of men; and good engineering staffs are now riding high in the estimation of mill managements. The disaster has made those mills which have maintained a well-equipped, well-manned mechanical department congratulate themselves on their foresight, and it has made those mills which have neglected this vital part of their organization regretful of their negligence. The lesson learned will not be forgotten for a long time to come.—*Editor.*

Mill Lighting Tests Conducted in S. C. Mills

Nation-wide industrial lighting conditions may be revolutionized, according to reports, as a result of a ten-weeks' test conducted by illumination engineers at Slater Mfg. Co., Slater, S. C., and American Spinning Co., Greenville, S. C. In an effort to fit the lighting to the "seeing task," intensity of illumination in various rooms of the two plants was varied until a point was reached whereby the operative could put out the best goods with the greatest efficiency and least eye strain. The experiments were carried out by W. J. Darley, Cleveland, Ohio, lighting expert, and the results will be published by the Illuminating Engineering Society. Some of the engineers who came to Greenville to inspect the work and to confer with Mr. Darley are shown in the accompanying photograph.

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Bad Steam Pipes Discussed by Engineer

Any leak at the flanged joint of the Van Stone, or similar type of pipe, carrying high-pressure steam should be carefully examined at once. If the leak is coming directly from between the flanges, it is probably caused by a defective gasket and is not particularly serious, although the joint should be repacked at the first opportunity. If, on the other hand, the leaking steam is coming from beween the loose flange and its corresponding pipe, it indicates that the pipe itself is defective, and the probable cause is a crack or break at the end of the pipe where it is flared over. Such a crack or break is very serious, since it may continue to extend around the pipe until the latter is so weakened that a complete rupture occurs. A new length of pipe should be installed as soon as possible, or a new end welded on after the defective end has been cut off.

—A PLANT ENGINEER

Plans Completed For Midwest Power Conference

Over 100,000 sq.ft. of floor space will be devoted to the products of the leading machinery manufacturers of the Nation at the Midwest Power Exposition, to be held in conjunction with the Midwest Power Engineering Conference at Chicago, April 20-24. Exhibits will include power transmission, diesel and internal-combustion engines, fuel and lubrication, fuel burners, water treatment, refractories, controls, piping, handling, motors, refrigeration, conveyors, etc. Twelve conference sessions will be held, at which about 35 technical papers will be presented by authorities in various fields of engineering.

•

American Enginering Council Re-Plans Work of Committees

In order to bring about unity of purpose between member organizations, and to simplify the understanding of the major objectives of the American Engineering Coucil, President Potter and the executive committe have decided that all committees should be re-grouped under four major headings, according to Frederick M. Feiker, executive secretary. The committees are now grouped as to (a) public affairs, (b) engineering-economics, (c) programs for united action of member organizations, and (d) the American Engineering Council operating committees. The general chairman of each of the four groups is a member of the executive committee.

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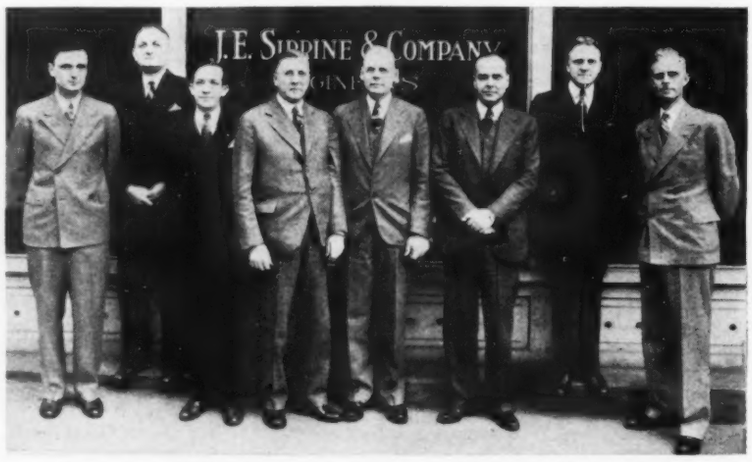
Winnsboro Operating 78 Rockwood Drives

The accompanying photograph shows a large number of Rockwood drives oper-



Eight illumination experts, shown above, conferred at Greenville, S. C., last month on the results of a 10-week lighting test conducted in two Greenville county mills. From left to right, the engineers are as follows: W. D. Darley, Cleveland, Ohio, who ran the experiment; E. F. Bassel, General Electric Co., Charlotte, N. C., Paul T. Tysinger, Duke Power Co., Charlotte; Prof. H. B. Dates, Cleveland, head of engineering at Case School of Applied Science; H. C. Swannell, J. E. Sirrine & Co., Greenville; Ward Harrison, Cleveland, director of illuminating for General Electric Co.; Roy A. Palmer, Duke Power Co., Charlotte; W. C. Brown, General Electric Co., Cleveland.

Rockwood drives on twisters at Winnsboro Mills

ating beam twisters at Winnsboro Mills, Winnsboro, S. C. There are 78 drives in use at this mill. Bases are engineered to fasten to the customer's shelf by bolts through slots. Motors are 15 hp., 1,200 r.p.m.; pulleys are 9¾ in. diameter, 13 in. centers, and carry 5-in. belts. In this same mill, a Rockwood drive has been operating a Carrier Engineering Co. air-conditioning fan for two years with no indicated wear or trouble of any sort, it is reported. In this case, there is an extraordinary pulley ratio of 9 to 1. The motor is 75 hp., 875 r.p.m.; pulleys are 11 to 100 in. diameters, 104 in. centers, and carry 14-in. heavy double belt.

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Master Mechanics Meeting Postponed

The Master Mechanics Division of the Southern Textile Association postponed the meeting set for April 10 at Spartanburg, S. C.

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Safety Notes

The slogan, "It is Intelligent to be Safe," was adopted by the Greater New York Safety Conference at its seventh annual meeting in March. It was pointed out that during last year total accidental deaths decreased from 101,139 in 1934 to 99,000 in 1935. Roger Williams, vice-president of Richardson & Boynton Co., was chairman.

Duplan Silk Corp., Hazelton, Pa., operated 1,639,909 employee hours, from Dec. 21, 1934, to Sept. 30, 1935, without a single disabling injury, according to a recent issue of the News Letter on Textile Safety. Average number of employees during the period was 1,190.

Sayles-Biltmore Bleacheries, Inc., Ashville, N. C., won the Western North Carolina Safety Council trophy cup for the period ending in February, having had a perfect record for four months.

The textile committee of the National Safety Council, of which Marion W. Heiss, employment director of the Cone group of mills, Greensboro, N. C., is chairman, met late in February at Greensboro. The gathering was featured with discussions of methods and practices used to promote safety in textile plants. Members from the Carolinas, Tennessee, Georgia, Illinois, and other states attended.

Riverside & Dan River Cotton Mills, Inc., Danville, Va., recently reported that its accident rate during 1935 was 50% less than the previous year. There were only 94 accidents in 1935 among 8,400 people working 15,500,000 hours.

ENGINEERING IN THIS ISSUE

	page
$7,500,000 Damage to New England Mills by Flood	82
2c. per 1,000 Gallons Is Mill's Cost to Purify Water	90
Tale of a Pail—It Started Modernization Program	104
Improved Lighting Speeds Colored Yarn Production	112
Filling from Doff Box Emptied Mechanically	118
Storage Charge Against Salvaged Equipment	119
Polishing Drum for Small Metal Parts	119
Unit Heater for Lint-Laden Air	126
Industrial Chair	127

Engineering Trade News

Link-Belt Co. stockholders at annual meeting at Stevens Hotel, Chicago, March 24, elected Alfred Kauffmann president, succeeding George P. Torrence, whose resignation as president and director of the company was accepted by the board on the previous day. Mr. Kauffmann started with the company 35 years ago as a draftsman. His career has included many responsibilities, such as designing engineer, superintendent of construction, sales engineer, vice-president and manager Link-Belt plant at Philadelphia, vice-president in charge of Link-Belt Dodge and Ewart plants at Indianapolis, and for the last four years first vice-president in charge of the company's Chicago plant operations. He was president of the company from 1924 to 1932, and has been a director since 1922.

Federated Metals Corp., New York, announces that Joseph F. Sweeney has joined its staff to specialize in the purchase of scrap nickel, nickel alloys and nickel-bearing materials.

Noland Co., Inc., Washington, D. C., has been appointed Toncan Iron sheet distributors, according to an announcement by N. J. Clarke, vice-president in charge of sales of Republic Steel Corp., Cleveland, Ohio.

Golden Gate Chapter of the American Society for Metals at Berkeley, Calif., listened to an address on the subject of steel castings by A. G. Zima at their March 16 meeting. Mr. Zima is with International Nickel Co. His talk dealt with the increased scope of engineering design and improvement in the foundry production of steel castings now possible because of the more complete control exercised over the variable factors in the foundry, and the wider use of the alloying principle. The history and usefulness of nickel as an alloying element were outlined in a lecture sponsored by the New Jersey Chapter of the American Society for Metals at Newark College of Engineering, March 20, by Mr. N. B. Pilling, manager of the Bayonne Laboratory of The International Nickel Co., Inc.

Hill Diesel Engine Co., Lansing, Mich., has announced the resignation of Fred E. Mengel, formerly sales manager, and the appointment of James M. Degnan, as sales manager, effective April 1. Mr. Degnan has been associated with the Worthington Pump & Machinery Corp. for the last ten years.

Piedmont Supply Co., Charlotte, N. C., has been appointed Carolinas agent for the Carolina Refractories Co., Hartsville, S. C., manufacturers of Careco one-piece furnace lining. **J. G. Iler,** southern agent for **A. W. Chesterton Co.,** Boston, has been added to the sales force, but will continue to carry the Chesterton line.

Jos. H. Bennis, vice-president and sales director of the New York & New Jersey Lubricant Co., has just returned from a six weeks' tour of South America. During his travels Mr. Bennis called upon many of the larger textile mills in the various South American countries who are now regularly using Non-Fluid Oil on carding, spinning, twisting, and weaving machinery.

Reliance Electric & Engineering Co., Cleveland, has added Philip A. Singleton, Philadelphia, and Jack K. Williams, Chicago, to its sales force.

General Refractories Co., Philadelphia, announces the appointment of Braman, Dow & Co., Boston, Mass., as dealer-agents in the Boston area. Braman, Dow & Co. will carry a complete stock of refractories.

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Engineering Mill News

American Felt Co., Franklin, Mass., has awarded general contract to the Brien Building Co., Inc., Woonsocket, R. I., for a power plant addition.

Ludlow (Mass.) **Mfg. Associates** have asked bids on general contract for new one-story power plant, 75 x 75 ft., at Edge Moor, Wilmington, Del., where work on new mill is now under way. Company recently purchased tract of 53 acres at location noted for new plant. Charles T. Main, Inc., Boston, Mass., is consulting engineer for power plant.

Lola Mills, Inc., Stanley, N. C., are installing new boiler equipment, renovating and painting the mill and overhauling the mill village. The company is also installing a new filter and water softener, together with new dyeing and bleaching equipment. Special finishing machinery for thread and knitting yarns has been added.

Springs Cotton Mills, Eureka plant, Chester, S. C., has remodeled its boiler room, and a passageway has been constructed to furnish more space for roving machinery.

FREE FOR THE ASKING—

READERS interested in the catalogs and other useful literature described on this page may secure copies by writing direct to the manufacturers mentioned.

Warp Sizing

E. F. Houghton & Co., 240 W. Somerset St., Philadelphia. February-March issue of *The Houghton Line* containing article on warp size check-up tests.

Traveling Cleaners

Parks-Cramer Co., Fitchburg, Mass. February issue of *Parks Parables* containing pictures of yarn made with benefit of cleaner as compared with yarn made without cleaner, the former said to contain 17 to 20% fewer gouts and bunches; also pictures of cleaner installations. March issue discussing self-cleaning atomizers and the Turbo humidifier.

Heat Exchanger

Duriron Co., Inc., Dayton, Ohio. First issue of new bulletin, *Duriron Heat Exchanger*, describing construction and applications of heat exchanger available in any Duriron corrosion-resisting alloy; viz., Duriron. Durichlor, Durimet, Durco Alloy Steels, Alcumite.

Alloy Steels and Irons

Electro Metallurgical Co., 30 E. 42d St., New York. March issue of *Electro Met Review* carrying brief article on dyeing with stainless steel equipment.

Full-Fashioned Knitting

Textile Machine Works, Reading, Pa. February issue of *Reading Record* containing article on narrowing menders, the fifth in a series on troubles encountered in knitting.

Power Transmission

Oilgear Co., 1319 W. Bruce St., Milwaukee, Wis. Bulletin 60,000 describing Oilgear fluid-power, variable-speed transmission which has been simplified and improved by a redesign of input and output units eliminating 13 parts from the piston. Available in 2- to 100-hp. units.

Flat-Spray

Chain Belt Co., Milwaukee, Wis. Leaflet describing Rex nonclogging, flat-spray nozzle for washing and cleaning.

Welding

Linde Air Products Co., 30 E. 42d St., New York. Illustrated booklet containing summary of all available information on bronze welding and surfacing. Booklet describing improved fabrication of 18-8 chromium steels. March issue of *Oxy-Acetylene Tips* describes a general training course for welding operators covering all phases of oxy-acetylene welding.

Tram-Rail Switches

Cleveland Crane & Engineering Co., Wickliffe, Ohio. Folder citing advantages and picturing installations of tram-rail switches.

Nickel-Alloy Composition

International Nickel Co., Inc., 67 Wall St., New York. Mailing piece offering engineers and metallurgists free two charts which serve as guides to the selection of nickel alloys. The first one indicates alloy-steel compositions which will develop a broad range of properties in simple shapes to 12 in. diameter or equivalent sections; chemical compositions listed on back. The second chart shows the composition and treatment to obtain improved properties in 49 types of commonly used iron castings.

Air Conditioning

Buffalo Forge Co., Buffalo, N. Y. Catalog giving specifications, description, and cooling charts for Type PC air-conditioning cabinets.

Rayon Warp Sizing

Charles B. Johnson, Paterson, N. J. February issue of *Rayon Warp Sizing Specialist* carrying article on temperature control in rayon warp sizing, by Victor Wichum, chief engineer, C. J. Tagliabue Mfg. Co.

Lignum-Vitae, a Hardwood

Lignum-Vitae Products Corp., Jersey City, N. J. Initial issue of *Lignum-Vitae Fact Flashes*, a periodical bulletin devoted to information pertaining to practical applications of Lignum-Vitae, the hardest and heaviest wood known, especially valuable for its self-lubricating characteristics. These bulletins are intended to bridge the gap until "The Industrial Uses of Lignum-Vitae, Champion of Hardwoods" is published and distributed, a booklet in which will be assembled all available data on this interesting and useful hardwood.

Handling Equipment

Lewis Shepard Co., Watertown, Mass. Illustrated colored folder No. 318, describing standard and special devices for handling any product, merchandise, goods, or material that is manufactured, stored, shipped, or handled.

Electric Motors

Reliance Electric & Engineering Co., Ivanhoe Rd., Cleveland, Ohio. Bulletin 117 describing advantages of Type AW wound-rotor motors.

Integral-Furnace Boiler

Babcock & Wilcox Co., 85 Liberty St., New York. New edition of booklet featuring integral-furnace boiler and containing details of design and construction, performance data, and photographs of six of the 58 units now installed or on order. An eight-page booklet describing properties of five mortars and plastics made by the company, has also been issued.

Switchgear Panels

General Electric Co., Schenectady, N. Y. Leaflet containing description and condensed specifications of switchgear panels for engine-driven generators.

Recording Instruments

Foxboro Co., Foxboro, Mass. Bulletin describing several all-aluminum portable recorders, some of which are said to have saved manufacturers as much as $800 a year.

Sulphonated Oils

National Oil Products Co., Harrison, N. J. Booklet, "Interpretation of Analysis for the Layman," defines terms used in analysis of raw and sulphonated oils so that they can be understood by those who have had little or no chemical training. Also contains chapter on applications of sulphonated oils and one on method of analysis.

Trucks

Fold-way Mfg. Co., Fremont, Ohio. Folder describing collapsible truck, said to save 78% storage space and much time in loading and unloading.

High-Speed Wool Warping

Davis & Furber Machine Co., North Andover, Mass. Folder entitled "A New System of High-Speed Warping for Woolen and Worsted Mills," describing equipment for making woolen warps at speeds to 260 yd. per min. and worsted warps at speeds to 400 yd. per min. A floor plan of the system is included, along with a view of the creel and other equipment.

Bobbins

L. M. Hartson Co., North Windham, Conn. Folder illustrating various types of fibre, Bakelite, stainless-steel, galvanized-iron, Udylite and Ambrac bobbins for silk and rayon mills.

Chain Drives; Anti-Friction Bearings

Link-Belt Co., 307 N. Michigan Ave., Chicago. New illustrated, 40-page, 6x9 in. catalog, No. 1520, covering complete line of anti-friction bearing units, including three new series. New 32-page 8½x11 in., illustrated book, No. 1725, containing horsepower and ratio tables, list prices, and other details of Silverstreak silent chain drives carried in stock.

Boiler Problems

L. J. Wing Mfg. Co., 144 W. 14th St. New York. Pocket-size handbook, "An Engineers Analysis of Certain Typical Boiler Problems and What to Do," containing technical information of interest to operators.

Water and Sewage Treatment

Merrimac Chemical Co., Everett Station, Boston, subsidiary of Monsanto Chemical Co. Booklet describing properties, uses and advantages of Ferrisul, a ferric iron coagulant for removing industrial wastes. Also leaflet devoted to sodium aluminate for use in water treatment.

Non-Corrosive Iron

Republic Steel Corp. Youngstown, Ohio. Mailing piece pointing out the advantages of corrosion-resisting Toncan iron for air-conditioning equipment.

Instruments

Julien P. Friez & Sons, Inc., Baltimore, Md. Series of bulletins: No. J devoted to anemometers, No. R devoted to round-chart electric recorders for humidity, temperature, etc. No. S devoted to standard measuring instruments for humidity including the pocket sling psychrometer, sling psychrometer, hand aspirated psychrometer, pocket psychrometric slide rule, etc.

Pumps and Engines

Worthington Pump & Machinery Corp., Harrison, N. J. Bulletins describing horizontal, duplex, piston pumps; Types GR, GE and GS rotary pumps; and the vertical four-cycle direct-injection Type D diesel engine.